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Global, regional, and national disability-adjusted life-years (DALYs) for 315 diseases and injuries and healthy life expectancy (HALE), 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015

*GBD 2015 DALYs and HALE Collaborators**

Summary

Background Healthy life expectancy (HALE) and disability-adjusted life-years (DALYs) provide summary measures of health across geographies and time that can inform assessments of epidemiological patterns and health system performance, help to prioritise investments in research and development, and monitor progress toward the Sustainable Development Goals (SDGs). We aimed to provide updated HALE and DALYs for geographies worldwide and evaluate how disease burden changes with development.

Methods We used results from the Global Burden of Diseases, Injuries, and Risk Factors Study 2015 (GBD 2015) for all-cause mortality, cause-specific mortality, and non-fatal disease burden to derive HALE and DALYs by sex for 195 countries and territories from 1990 to 2015. We calculated DALYs by summing years of life lost (YLLs) and years of life lived with disability (YLDs) for each geography, age group, sex, and year. We estimated HALE using the Sullivan method, which draws from age-specific death rates and YLDs per capita. We then assessed how observed levels of DALYs and HALE differed from expected trends calculated with the Socio-demographic Index (SDI), a composite indicator constructed from measures of income per capita, average years of schooling, and total fertility rate.

Findings Total global DALYs remained largely unchanged from 1990 to 2015, with decreases in communicable, neonatal, maternal, and nutritional (Group 1) disease DALYs offset by increased DALYs due to non-communicable diseases (NCDs). Much of this epidemiological transition was caused by changes in population growth and ageing, but it was accelerated by widespread improvements in SDI that also correlated strongly with the increasing importance of NCDs. Both total DALYs and age-standardised DALY rates due to most Group 1 causes significantly decreased by 2015, and although total burden climbed for the majority of NCDs, age-standardised DALY rates due to NCDs declined. Nonetheless, age-standardised DALY rates due to several high-burden NCDs (including osteoarthritis, drug use disorders, depression, diabetes, congenital birth defects, and skin, oral, and sense organ diseases) either increased or remained unchanged, leading to increases in their relative ranking in many geographies. From 2005 to 2015, HALE at birth increased by an average of 2·9 years (95% uncertainty interval 2·9–3·0) for men and 3·5 years (3·4–3·7) for women, while HALE at age 65 years improved by 0·85 years (0·78–0·92) and 1·2 years (1·1–1·3), respectively. Rising SDI was associated with consistently higher HALE and a somewhat smaller proportion of life spent with functional health loss; however, rising SDI was related to increases in total disability. Many countries and territories in central America and eastern sub-Saharan Africa had increasingly lower rates of disease burden than expected given their SDI. At the same time, a subset of geographies recorded a growing gap between observed and expected levels of DALYs, a trend driven mainly by rising burden due to war, interpersonal violence, and various NCDs.

Interpretation Health is improving globally, but this means more populations are spending more time with functional health loss, an absolute expansion of morbidity. The proportion of life spent in ill health decreases somewhat with increasing SDI, a relative compression of morbidity, which supports continued efforts to elevate personal income, improve education, and limit fertility. Our analysis of DALYs and HALE and their relationship to SDI represents a robust framework on which to benchmark geography-specific health performance and SDG progress. Country-specific drivers of disease burden, particularly for causes with higher-than-expected DALYs, should inform financial and research investments, prevention efforts, health policies, and health system improvement initiatives for all countries along the development continuum.

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See **Editorial** page 1447

See **Comment** pages 1448 and 1450

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Introduction

Summary measures of population health are crucial inputs to guide health system investments and set priorities at global, regional, national, and subnational levels. The Millennium Development Goals (MDGs), which sought to reduce extreme poverty and improve health, expired in 2015, and were replaced by the 2030 Agenda for Sustainable Development, or Sustainable Development Goals (SDGs).[1] The shift from the MDGs to the SDGs reflects a broadening of the global development agenda,[2,3] expanding to include targets for non-communicable diseases (NCDs) and indicators that consider the interplay of environmental, societal, and economic factors on health.[4] Within this context, summary population health measures are advantageous because they can easily be used to show progress toward SDG 3—to "ensure healthy lives and promote well-being for all at all ages"—and provide a metric by which comparative progress on other SDGs can be monitored.[5] Summary measures also provide insights into whether, as societies live longer, they spend more or less of their time with functional health loss, known as the expansion or compression of morbidity, respectively, which has profound implications for societies and the financing of health systems.

Two types of population health summary measures exist: health expectancies and health gaps.[6] Healthy life expectancy (HALE), which originates from Sullivan,[7] provides a single summary measure of population health by weighting years lived with a measure of functional health loss experienced before death. Many health expectancy measures have been proposed, but HALE is the only one that captures a full range of functional health loss.[8–10] Health gap measures capture differences between a population and some normative standard such as a maximum lifespan in full health. Disability-adjusted life-years (DALY) are a widely used gap measure,[6,9–11] representing the sum of years of life lost (YLLs) due to premature mortality and years lived with disability (YLDs). YLLs quantify the gap between observed mortality and a normative life expectancy,[12] and YLDs capture the prevalence of conditions that lead to non-fatal health loss while accounting for the severity of those conditions. Health gap measures can be easily disaggregated to examine contributions of relative morbidity and mortality, individual diseases, injuries, and attributable risk factors.

The Global Burden of Diseases, Injuries, and Risk Factors (GBD) study is the most comprehensive source of comparable summary population health measures because of its inclusion of country-level results, uncertainty quantification, and its effort to maximise comparability across geography, time, and across different health conditions. Alternative summary health assessments are not as standardised or comprehensive, with studies reporting only incomplete time-series, no uncertainty measures, or only a subset of countries and causes.[13–15] WHO published DALY estimates for 2 years (2000 and 2012), with 132 causes and 174 countries and

Research in context

Evidence before this study

Disability-adjusted life-years (DALYs), a summary measure of population health based on estimates of premature mortality and non-fatal health loss, originated from the initial Global Burden of Disease (GBD) study in 1993. DALYs, in combination with other summary measures such as healthy life expectancy (HALE), offer relatively simple yet powerful metrics against which progress and challenges in improving disease burden and extending healthy lifespans can be effectively monitored over time. Published in 2012, GBD 2010 provided updated estimates of DALYs due to 291 causes and HALE in 187 countries from 1990 to 2010. GBD 2013 extended this time series to 2013, with 188 countries, and 306 causes. Novel analyses for quantifying epidemiological transitions were introduced as part of GBD 2013, enabling a comparison of shifts in years of life lost (YLLs) and years lived with disability (YLDs) with increasing levels of development. WHO has produced estimates of DALYs and HALE largely based on GBD 2010 and GBD 2013; however, modifications were implemented for a subset of causes, disability weights, and countries, and a normative life table of 91·9 years at birth was used for calculating YLLs.

Added value of this study

For GBD 2015, we generated estimates of HALE and DALYs for 315 causes by geography, sex, and age group from 1990 to 2015 for 195 countries and territories. We constructed a summary metric referred to as the Socio-demographic Index (SDI) based on measures of income per capita, average years of schooling, and total fertility rate. We estimated SDI for each geography-year, and characterised the average relationship for each age, sex, and cause for DALYs and HALE with SDI. Using these relationships, we calculated expected levels of DALYs, life expectancy, and HALE for each geography over time. We compared observed patterns of both DALYs and HALE with those expected on the basis of SDI, allowing us to explore where health gains exceeded—or lagged behind—corresponding changes in development.

Implications

Since 1990, overall health has improved in most countries, with particularly large gains occurring in the past 10 years. Although improved health means longer lifespans, it also translates to more years of functional health lost. The fraction of overall life expectancy spent in poor health is generally constant or has slightly declined in some countries, a result driven by declines in DALYs due to communicable, maternal, nutritional, and neonatal causes and increases in others, mainly non-communicable diseases. Country-specific drivers of disease burden, particularly when observed DALYs are higher than expected on the basis of SDI, should inform country-specific inquiry and action.

without uncertainty intervals. These estimates were derived primarily from GBD 2010 results, but were modified in 60 countries and for 12 cause groups separately estimated by WHO and UN agencies.[13,16,17] WHO applied the same approach for GBD 2013 results and used their own life tables to produce HALE estimates for 2015.[14] The European Commission (EC) and the Organisation for Economic Co-operation and Development (OECD) also reported healthy life expectancy estimates for European countries from 2004 through 2014, but these were based on self-reported health status.[18,19]

Here we present GBD 2015 findings for DALYs and HALE, building upon updated estimates of mortality, causes of death, and non-fatal health loss.[12,20] Overall analytic approaches are similar to previous GBD studies,[9,10] but include new mortality and morbidity data, refined methods, and expanded geographies.[12,20] This report supersedes all previous GBD studies on DALYs and HALE through the estimation of a complete time-series for 1990 to 2015. To facilitate a more in-depth examination of the drivers of DALY and HALE trends, we assess how HALE, along with overall and cause-specific DALYs, change as geographies move through the development continuum. We use this analysis to benchmark overall progress and decompose observed disease burden compared with levels expected for specific causes on the basis of development alone, to highlight potential areas for policy investment or further research.

Methods

Overview

Detailed methods for estimating DALYs and HALE, including analytic approaches for mortality and non-fatal health loss estimation, are provided in related publications.[12,20] Additional detail on GBD metrics and definitions are found elsewhere.[21] Interactive tools are also available to explore GBD 2015 results and data sources. This analysis follows the Guidelines for Accurate and Transparent Health Estimates Reporting (GATHER), which includes recommendations on documentation of data sources, estimation methods, and statistical analysis.[22,23]

In brief, the GBD geographic hierarchy involves 519 total geographies within 195 countries and territories, 21 regions, and seven super-regions. This study reports results for all countries and territories. The GBD cause hierarchy has four levels of classification and causes reported within each level that are mutually exclusive and collectively exhaustive. The full GBD cause list with corresponding International Classification of Diseases (ICD)-9 and ICD-10 codes are available in our publications on cause-specific mortality[12] and non-fatal health outcomes.[20]

Estimation of mortality and non-fatal health loss

We estimated all-cause and cause-specific mortality with a multistep computation process, which included systematically addressing known data challenges, such as different coding schemes, different age-group reporting, variation in certification, misclassification of HIV/AIDS deaths in some countries, misclassification of maternal HIV/AIDS deaths, and incorporation of population-based cancer registry data, before computation of cause-specific mortality with analytic tools such as Cause of Death Ensemble Modelling (CODEm). Each death could have only one underlying cause. Additional detail, including model specifications and data availability for each cause-specific model, can be found in the supplementary material of the GBD 2015 mortality and causes of death publication.[12] We calculated normative life tables based on the lowest death rates for each age group among geographies with total populations greater than 5 million. We computed cause-specific YLLs by multiplying cause-specific deaths by the life expectancy at the age of death (ie, 86·59 years at age 0 years; 23·79 years at age 65 years) from this normative life table, and then used the GBD world population age standard to calculate age-standardised mortality rates and YLL rates.[12]

Our most commonly used analytic approach to estimate non-fatal health loss was DisMod-MR 2.1, a Bayesian meta-regression tool that synthesises diverse data sources to produce internally consistent estimates of incidence, prevalence, remission, and excess mortality. The use of other methods to estimate non-fatal health loss was determined by cause-specific data availability and epidemiological characteristics.[24] Additional detail, including model specifications and data availability for each cause-specific model, can be found in the supplementary material of the GBD 2015 non-fatal publication.[20] Each non-fatal sequela was estimated separately. We then applied a microsimulation framework to assess the occurrence of comorbidity in each age group, sex, geography, and year separately. Disability from comorbid conditions was apportioned to each of the contributing causes. GBD disability weights were based on population surveys with more than 60 000 respondents, and previous studies show that disability weights do not significantly vary across geographies, income, or educational attainment.[25,26] In this study, disability weights are invariant over geography and time, although the distribution of sequelae, and therefore the severity and cumulative disability per case of a condition, can differ by age, sex, geography, and year.

For the **interactive visualisation of GBD 2015 results** see http://vizhub.healthdata.org/gbd-compare/

For the **data citation tool** see http://ghdx.healthdata.org/gbd-data-input-sources

Estimation of DALYs, HALE, and corresponding uncertainty

DALYs are the sum of YLLs and YLDs as estimated in GBD 2015 for each cause, geography, age group, sex, and year.[12,20] Using methods developed by Sullivan,[7] we calculated HALE by age group within abridged multiple-decrement life tables and estimates of YLDs per capita for each geography–age–sex–year from 1990 to 2015.[8,10,27]

For all results, we report 95% uncertainty intervals (UIs), which were derived from 1000 draws from the posterior distribution of each step in the estimation process. UIs are distinct from confidence intervals, because confidence

intervals only capture the uncertainty associated with sampling error, whereas uncertainty intervals provide a method for propagation of uncertainty from multiple sources including sampling, model estimation, and model specification. 95% UIs represent the ordinal 25th and 975th draw of the quantity of interest. For mortality and YLLs, UIs reflect uncertainty that arises from sample sizes of studies used as data sources, adjustments to sources of all-cause mortality, parameter uncertainty in model estimation, and specification uncertainty for all-cause and cause-specific models. For prevalence, incidence, and YLDs, UIs reflect the uncertainty that arises from sample sizes of studies used as data sources, data adjustments from non-reference definitions, parameter uncertainty in model estimation, and uncertainty in the disability weights. In the absence of any direction information about the correlation between uncertainty in YLLs and YLDs, we assumed uncertainty in age-specific YLDs is independent of age-specific YLLs in DALYs and death rates in HALE.

Epidemiological transition and relationship between DALYs, HALE, and SDI

We examined the relationship between DALYs, HALE, and the Socio-demographic Index (SDI).[28] SDI was constructed based on the geometric mean of three indicators: income per capita, average years of schooling among people aged 15 years or older, and the total fertility rate. SDI values were scaled to a range of 0 to 1, with 0 equalling the lowest income, lowest schooling, and highest fertility rate observed from 1980 to 2015, and 1 equalling the highest income, highest schooling, and lowest fertility rate assessed during that time. The average relationships between each summary health measure and SDI were estimated using spline regressions. These regressions were used to estimate expected values at each level of SDI. Additional detail on SDI computation and geography-specific SDI values are available in the appendix (pp 4–5 and pp 74–80).

See Online for appendix

Role of the funding source

The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Results

Global trends for DALYs and HALE

Worldwide total DALYs due to Group 1 causes fell from 1·2 billion (95% CI UI 1·2–1·2) in 1990, to 741·6 million (703·9–787·7) in 2015, whereas total DALYs due to NCDs increased from 1·1 billion (1·0–1·2), to 1·5 billion (1·3–1·7; figure 1; table 1). Total injury DALYs were relatively unchanged between 1990 and 2015. All-age DALY rates for NCDs changed little between 1990 and 2015, whereas they declined substantially for Group 1 causes. Taking into account population ageing, DALY rates for Group 1 causes and NCDs both decreased (figure 1). For injuries, reductions in all-age DALY rates and age-standardised DALY rates were similar between 1990 and 2015.

HALE at birth increased to 60·9 years for men and 64·9 years for women in 2015, rising 2·9 years and 3·5 years since 2005, respectively (table 2). The gap between life expectancy and HALE, which represents years of functional health lost, widened between 2005 and 2015 from 7·7 years to 8·1 years for men, and from 9·4 years to 10·0 years for women. Life expectancy at age 65 years was 15·5 years for men and 18·5 years for women, while HALE was 11·9 years and 14·2 years for each sex, respectively (table 2).

Global causes of DALYs

In 2015, Group 1 causes accounted for 30·1% (95% UI 28·6–31·7%) of global DALYs, with NCDs leading to 59·7% (57·8–61·5) and injuries to 10·1% (9·5–10·7; table 1). Since 2005, DALYs due to many of the world's leading communicable causes substantially declined, yet burden increased for a subset of infectious diseases. Age-standardised DALY rates from HIV/AIDS and malaria each fell by more than 40% and lower respiratory infections and diarrhoeal diseases had decreases in total and age-standardised rates of DALYs of more than 20% (table 1). From 2005 to 2015, reductions in both total and age-standardised DALY rates due to tetanus and measles surpassed 50% and 70%, respectively. African trypanosomiasis, a disease targeted for elimination, saw both total DALYs and age-standardised rates fall by more than 70% since 2005. DALY rates substantially fell for all types of hepatitis, with age-standardised DALY rates from acute hepatitis A declining by more than 35% by 2015. However, both total DALYs and age-standardised DALY rates from dengue increased by more than 50%. Although the west African Ebola virus outbreak peaked in 2014,[29] Ebola virus disease still caused substantial DALYs in 2015 (table 1). Maternal disorders significantly declined from 2005 to 2015, with total DALYs and age-standardised rates each falling by more than 20%. Reductions in the global burden of neonatal disorders were somewhat less pronounced; for instance, the number of DALYs due to neonatal sepsis was largely unchanged (table 1).

In 2015, cardiovascular diseases, cancers, and mental and substance use disorders were among the leading causes of NCD burden (table 1). For many NCDs, including most cardiovascular causes and most cancers, total DALYs increased but age-standardised DALY rates declined. Nearly all neurological disorders increased in total DALYs, including Alzheimer's disease and other dementias, which rose by more than 30%, whereas age-standardised rates either moderately decreased (eg, Alzheimer's disease and other dementias) or were relatively unchanged (eg, Parkinson's disease). Total DALYs from low back and neck pain also increased, rising by more than 17%. Cirrhosis caused more DALYs in 2015 than in 2005, although age-standardised DALY rates significantly fell. A similar overall

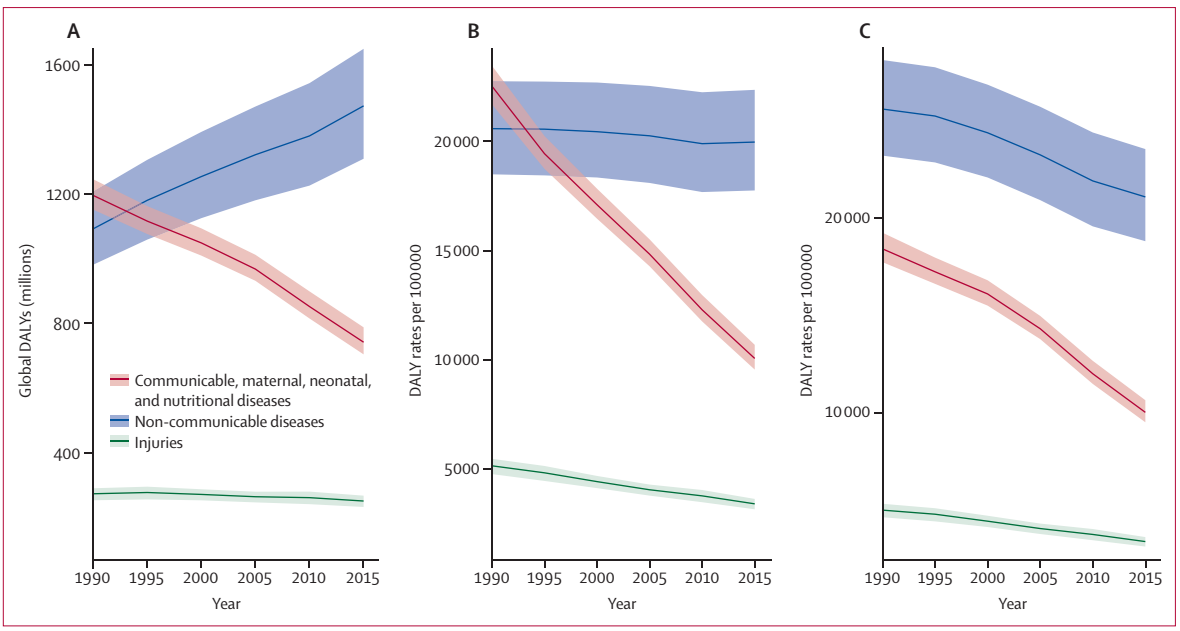

Figure 1: **Trends from 1990 to 2015, by GBD Level 1 cause, in global DALYs (A), crude DALY rates (B), and age-standardised DALY rates (C)**
The difference in trends between (A) and (B) is caused by population growth and the difference between (B) and (C) is caused by changes in the percentage distribution of the population by age. Shaded areas show 95% uncertainty intervals. DALYs=disability-adjusted life-years.

trend was found for diabetes and chronic kidney disease, with all aetiologies apart from chronic kidney disease due to diabetes, showing significant declines in age-standardised DALY rates amid rising total DALYs. For other NCDs, namely those associated with skin diseases, sensory conditions, and oral disorders, total DALYs significantly increased from 2005 to 2015, and age-standardised DALY rates either somewhat increased or did not significantly change since 2005. Age-standardised DALY rates due to chronic obstructive pulmonary disease fell by more than 20% from 2005 to 2015, while those due to asthma decreased by almost 17%. Peptic ulcer disease, a leading cause of digestive disease burden, saw marked reductions in total DALYs and age-standardised DALY rates, with the latter decreasing by nearly 30% (table 1).

A number of NCDs significantly increased in terms of total burden and age-standardised DALY rates. Osteoarthritis was the most notable example, with total DALYs rising by 35% and age-standardised DALY rates by 4% between 1990 and 2015. Major depressive disorders and drug use disorders, particularly of opioids and cocaine, both increased in total DALYs and age-standardised rates; however, age-standardised DALY rates from alcohol use disorders dropped by 19%. Total DALYs and age-standardised DALY rates from chronic kidney disease due to diabetes also significantly increased by 2015. Male and female infertility accounted for a relatively small fraction of NCDs, but burden due to both causes increased significantly since 2005. Oral disorders and sense organ diseases also had increased total DALYs, whereas age-standardised DALY rates were relatively unchanged since 2005.

Unintentional injuries and transport injuries each saw age-standardised DALY rates significantly decrease (20% and 17%, respectively). Road injury burden significantly declined from 2005, with age-standardised DALY rates falling by 18% by 2015. Among unintentional injuries, drowning had the largest reduction in both total burden (26%) and age-standardised DALY rates (32%). Age-standardised DALY rates from self-harm and interpersonal violence both fell by more than 16% since 2005. DALYs due to forces of nature, war, and legal intervention increased from 2005 to 2015, although not significantly; this rise was primarily driven by escalated violence and war in the Middle East. Despite still causing major health loss in 2015, forces of nature caused far fewer DALYs than in 2005, mainly because there were no large-scale losses of life like that seen in the 2005 earthquake that killed more than 70 000 people in India and Pakistan.

Changes in leading causes of disease burden over time

In 1990, lower respiratory infections, preterm birth complications, and diarrhoeal diseases were the three leading causes of global DALYs; by 2015, only lower respiratory infections remained in the leading three (figure 2). Many Group 1 causes had significant declines for total burden, as well as all-age DALY rates and age-standardised DALY rates, for both time periods; these causes included tuberculosis, meningitis, diarrhoeal diseases, protein-energy malnutrition, preterm birth complications, tetanus, and measles. Such reductions across measures of DALYs contributed to downward shifts in relative ranks for most Group 1 causes over time. Malaria and HIV/AIDS both diverged from this trend,

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
All causes	**2 553 306·8 (2 373 137·6 to 2 756 328·0)**	**2 464 895·4 (2 259 889·0 to 2 696 510·8)**	**−3·5 (−5·3 to −1·8)***	**41 561·7 (38 640·8 to 44 850·4)**	**34 445·7 (31 603·0 to 37 654·3)**	**−17·1 (−18·7 to −15·7)***
Communicable, maternal, neonatal, and nutritional diseases	**968 014·5 (931 809·4 to 1 012 327·9)**	**741 595·9 (703 928·7 to 787 659·9)**	**−23·4 (−25·2 to −21·7)***	**14 297·6 (13 766·0 to 14 955·1)**	**10 007·2 (9 498·5 to 10 629·3)**	**−30·0 (−31·6 to −28·5)***
HIV/AIDS and tuberculosis	**148 685·6 (141 013·7 to 160 635·2)**	**106 991·8 (99 680·8 to 116 789·9)**	**−28·0 (−30·6 to −25·1)***	**2296·0 (2172·7 to 2490·5)**	**1 435·5 (1 336·0 to 1 569·2)**	**−37·5 (−39·6 to −35·0)***
Tuberculosis	49 769·6 (43 196·4 to 60 348·2)	40 302·2 (34 065·8 to 49 653·9)	−19·0 (−24·2 to −13·6)*	817·0 (708·5 to 990·9)	552·4 (467·2 to 681·3)	−32·4 (−36·7 to −27·9)*
HIV/AIDS	98 916·1 (94 515·6 to 103 953·2)	66 689·5 (63 342·9 to 70 788·3)	−32·6 (−35·2 to −29·5)*	1478·9 (1414·0 to 1553·2)	883·1 (839·2 to 937·1)	−40·3 (−42·6 to −37·5)*
HIV/AIDS—tuberculosis	19 327·0 (15 512·5 to 22 015·1)	11 621·9 (8 955·5 to 13 412·3)	−39·9 (−44·2 to −34·5)*	289·6 (232·8 to 329·8)	154·0 (118·7 to 177·7)	−46·8 (−50·7 to −42·1)*
HIV/AIDS resulting in other diseases	79 589·0 (74 869·9 to 85 308·1)	55 067·6 (51 480·9 to 59 294·3)	−30·8 (−34·2 to −26·9)*	1189·3 (1119·8 to 1277·1)	729·1 (681·9 to 784·8)	−38·7 (−41·7 to −35·3)*
Diarrhoea, lower respiratory, and other common infectious diseases	**333 534·0 (317 202·5 to 351 569·5)**	**242 875·8 (230 350·0 to 255 919·1)**	**−27·2 (−30·2 to −24·2)***	**5005·5 (4769·5 to 5269·7)**	**3326·2 (3158·6 to 3503·4)**	**−33·5 (−36·2 to −30·9)***
Diarrhoeal diseases	98 394·2 (90 909·6 to 106 634·4)	71 589·5 (66 442·9 to 77 205·8)	−27·2 (−33·2 to −20·8)*	1479·8 (1371·9 to 1598·4)	976·9 (908·1 to 1052·7)	−34·0 (−39·3 to −28·4)*
Intestinal infectious diseases	15 062·4 (8 707·5 to 24 651·4)	12 632·0 (7 250·5 to 20 762·5)	−16·1 (−22·9 to −9·9)*	216·0 (124·9 to 353·2)	170·8 (98·2 to 280·7)	−20·9 (−27·3 to −14·9)*
Typhoid fever	12 543·9 (6 953·1 to 21 143·4)	10 575·6 (5 896·1 to 17 598·0)	−15·7 (−22·7 to −9·3)*	179·8 (99·7 to 302·9)	143·0 (79·8 to 237·7)	−20·5 (−26·9 to −14·2)*
Paratyphoid fever	2393·2 (1119·8 to 4569·5)	2014·8 (960·5 to 3848·4)	−15·8 (−24·2 to −7·4)*	34·4 (16·1 to 65·6)	27·2 (13·0 to 52·0)	−20·8 (−28·7 to −12·6)*
Other intestinal infectious diseases	125·4 (39·3 to 243·9)	41·5 (16·3 to 81·3)	−66·9 (−78·0 to −47·0)*	1·8 (0·6 to 3·5)	0·6 (0·2 to 1·1)	−69·3 (−79·5 to −51·6)*
Lower respiratory infections	135 293·2 (127 083·7 to 143 499·4)	103 048·6 (96 128·2 to 109 078·8)	−23·8 (−28·2 to −19·4)*	2 070·3 (1 939·4 to 2 189·6)	1428·5 (1330·5 to 1511·1)	−31·0 (−34·8 to −27·1)*
Upper respiratory infections	2 661·2 (1 550·4 to 4 406·1)	2868·4 (1650·2 to 4785·2)	7·8 (5·2 to 9·7)*	40·1 (23·5 to 66·4)	38·7 (22·3 to 64·5)	−3·5 (−5·6 to −2·1)*
Otitis media	3444·4 (2276·8 to 5004·0)	3497·6 (2284·9 to 5088·5)	1·5 (−1·3 to 4·1)	50·9 (33·7 to 74·1)	47·3 (30·9 to 68·7)	−7·2 (−9·9 to −4·9)*
Meningitis	28 394·6 (24 170·2 to 32 237·2)	25 394·6 (21 653·2 to 30 649·0)	−10·6 (−20·1 to 3·8)	416·8 (355·2 to 471·9)	342·4 (292·3 to 412·8)	−17·8 (−26·4 to −4·6)*
Pneumococcal meningitis	7826·5 (6404·7 to 9672·3)	7773·4 (6353·4 to 9900·2)	−0·7 (−11·2 to 14·9)	115·3 (94·8 to 141·6)	104·9 (85·9 to 133·4)	−9·0 (−18·5 to 5·3)
Haemophilus influenzae type B meningitis	8507·6 (6656·5 to 10590·4)	5345·7 (4146·7 to 7103·2)	−37·2 (−45·8 to −25·0)*	123·3 (96·7 to 153·4)	71·9 (55·9 to 95·4)	−41·7 (−49·7 to −30·5)*
Meningococcal meningitis	5239·8 (4012·0 to 6704·3)	5065·6 (3879·5 to 6721·8)	−3·3 (−16·9 to 16·3)	76·6 (59·0 to 97·6)	68·2 (52·3 to 90·3)	−11·0 (−23·4 to 6·9)
Other meningitis	6820·7 (5665·6 to 8234·7)	7210·0 (5953·9 to 8958·4)	5·7 (−4·6 to 20·3)	101·7 (84·9 to 122·0)	97·4 (80·5 to 120·9)	−4·2 (−13·1 to 9·0)
Encephalitis	8850·1 (8064·3 to 9665·8)	8452·5 (7668·6 to 9411·6)	−4·5 (−11·6 to 2·9)	132·1 (120·8 to 144·2)	114·6 (104·0 to 127·6)	−13·2 (−19·7 to −6·8)*
Diphtheria	443·2 (229·3 to 905·0)	170·8 (83·4 to 388·7)	−61·5 (−86·1 to 3·5)	6·4 (3·3 to 13·1)	2·3 (1·1 to 5·2)	−64·2 (−87·1 to −3·7)*
Whooping cough	8559·1 (3269·5 to 19234·7)	5070·5 (1815·7 to 10791·8)	−40·8 (−77·3 to 62·2)	123·2 (47·0 to 276·7)	68·0 (24·3 to 144·7)	−44·8 (−78·8 to 51·2)
Tetanus	7213·2 (6251·3 to 9082·1)	3510·0 (3002·2 to 4502·9)	−51·3 (−58·0 to −43·8)*	105·1 (90·6 to 134·4)	47·1 (40·3 to 60·6)	−55·1 (−61·2 to −48·1)*
Measles	24 602·4 (9 272·8 to 51 178·0)	6150·1 (2193·1 to 13467·4)	−75·0 (−84·4 to −59·0)*	355·1 (133·9 to 738·2)	82·7 (29·5 to 181·1)	−76·7 (−85·5 to −61·8)*
Varicella and herpes zoster	616·0 (521·8 to 727·1)	491·2 (386·1 to 625·3)	−20·3 (−33·2 to −4·3)*	9·7 (8·2 to 11·5)	6·8 (5·3 to 8·6)	−29·9 (−40·6 to −16·7)*

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Neglected tropical diseases and malaria	**116 583·6 (96 865·6 to 137 551·5)**	**79 212·2 (63 820·2 to 97 299·0)**	**–32·1 (–40·2 to –23·7)***	**1710·8 (1422·4 to 2019·1)**	**1066·4 (859·1 to 1310·2)**	**–37·7 (–45·1 to –30·1)***
Malaria	90 438·1 (73 336·5 to 107 546·9)	55 769·6 (42 478·4 to 69 078·5)	–38·3 (–48·1 to –27·8)*	1315·8 (1067·0 to 1562·5)	749·3 (571·0 to 927·9)	–43·1 (–52·0 to –33·4)*
Chagas disease	243·6 (220·0 to 273·5)	236·1 (211·8 to 265·3)	–3·0 (–8·5 to 3·0)	4·4 (4·0 to 5·0)	3·4 (3·1 to 3·9)	–22·7 (–27·0 to –18·0)*
Leishmaniasis	1367·1 (878·4 to 1979·8)	1418·9 (1005·8 to 1913·8)	3·8 (–8·6 to 19·3)	20·1 (13·0 to 28·9)	18·9 (13·4 to 25·5)	–5·9 (–16·9 to 8·0)
Visceral leishmaniasis	1334·4 (844·9 to 1949·5)	1377·4 (965·4 to 1863·8)	3·2 (–9·2 to 19·1)	19·6 (12·4 to 28·5)	18·3 (12·9 to 24·8)	–6·3 (–17·4 to 7·9)
Cutaneous and mucocutaneous leishmaniasis	32·6 (15·2 to 63·3)	41·5 (19·4 to 81·0)	27·3 (23·6 to 30·6)*	0·5 (0·2 to 1·0)	0·6 (0·3 to 1·1)	11·4 (8·2 to 14·5)*
African trypanosomiasis	803·1 (425·6 to 1311·4)	202·4 (104·6 to 322·3)	–74·8 (–80·4 to –68·2)*	11·8 (6·3 to 19·3)	2·7 (1·4 to 4·3)	–77·2 (–82·3 to –71·3)*
Schistosomiasis	3417·7 (1883·7 to 6044·0)	2613·3 (1409·9 to 4695·8)	–23·5 (–30·6 to –6·7)*	51·1 (28·4 to 90·0)	35·1 (19·0 to 62·9)	–31·3 (–37·7 to –16·2)*
Cysticercosis	369·6 (260·6 to 489·8)	303·6 (211·4 to 410·9)	–17·9 (–22·7 to –13·5)*	5·9 (4·2 to 7·8)	4·1 (2·9 to 5·5)	–30·4 (–34·3 to –26·5)*
Cystic echinococcosis	174·1 (141·3 to 212·4)	172·6 (132·1 to 220·6)	–0·8 (–7·4 to 4·5)	2·8 (2·2 to 3·4)	2·4 (1·8 to 3·0)	–14·7 (–20·2 to –10·2)*
Lymphatic filariasis	2476·6 (1272·2 to 4008·8)	2075·0 (1120·5 to 3311·5)	–16·2 (–32·1 to –3·8)*	38·9 (20·0 to 63·1)	28·1 (15·2 to 44·9)	–27·7 (–41·5 to –17·0)*
Onchocerciasis	1441·6 (835·2 to 2288·7)	1135·7 (545·8 to 2005·7)	–21·2 (–38·6 to –4·8)*	22·5 (13·2 to 35·5)	15·5 (7·5 to 27·3)	–31·2 (–46·8 to –16·0)*
Trachoma	282·6 (194·3 to 396·1)	279·2 (192·5 to 396·2)	–1·2 (–5·6 to 3·0)	5·5 (3·8 to 7·7)	4·2 (2·9 to 5·9)	–23·9 (–27·6 to –20·3)*
Dengue	1132·8 (795·9 to 1616·2)	1892·2 (1266·7 to 2925·2)	67·0 (16·8 to 166·1)*	16·6 (11·7 to 23·8)	25·5 (17·1 to 39·5)	53·5 (7·3 to 144·1)*
Yellow fever	400·8 (83·3 to 1083·2)	329·8 (66·9 to 898·1)	–17·7 (–34·1 to 1·7)	5·8 (1·2 to 15·6)	4·4 (0·9 to 12·1)	–23·0 (–38·2 to –4·9)*
Rabies	1760·6 (1525·6 to 2019·8)	931·6 (779·2 to 1120·9)	–47·1 (–54·2 to –39·3)*	26·4 (23·0 to 30·2)	12·6 (10·6 to 15·2)	–52·1 (–58·6 to –45·2)*
Intestinal nematode infections	4404·5 (2719·6 to 6783·4)	3378·3 (2046·2 to 5294·5)	–23·3 (–27·4 to –18·2)*	65·8 (40·6 to 101·4)	45·6 (27·6 to 71·4)	–30·7 (–34·5 to –26·1)*
Ascariasis	1693·0 (1061·5 to 2610·7)	1075·4 (685·1 to 1660·9)	–36·5 (–43·1 to –29·5)*	25·2 (15·8 to 39·0)	14·5 (9·2 to 22·4)	–42·5 (–48·6 to –36·2)*
Trichuriasis	653·1 (357·9 to 1076·3)	544·1 (289·3 to 946·1)	–16·7 (–30·6 to 3·7)	9·8 (5·4 to 16·1)	7·3 (3·9 to 12·8)	–24·9 (–37·5 to –6·7)*
Hookworm disease	2058·4 (1275·6 to 3171·3)	1758·8 (1085·8 to 2755·1)	–14·6 (–19·9 to –9·4)*	30·8 (19·0 to 47·4)	23·7 (14·7 to 37·1)	–22·9 (–27·7 to –18·1)*
Food-borne trematodiases	1625·6 (793·1 to 3058·3)	1686·5 (855·0 to 3072·8)	3·7 (–0·5 to 10·1)	25·1 (12·3 to 47·0)	22·6 (11·5 to 41·0)	–10·0 (–13·5 to –5·2)*
Leprosy	30·8 (20·6 to 43·0)	31·0 (20·8 to 43·6)	0·6 (–1·5 to 2·9)	0·5 (0·4 to 0·8)	0·4 (0·3 to 0·6)	–19·2 (–20·8 to –17·4)*
Ebola virus disease	0·8 (0·7 to 1·0)	295·4 (238·3 to 353·8)	36 024·8 (36 010·3 to 36 054·6)*	0·0 (0·0 to 0·0)	3·9 (3·2 to 4·7)	31 654·0 (31 640·5 to 31 681·3)*
Other neglected tropical diseases	6213·6 (3655·0 to 11309·8)	6461·0 (3516·3 to 13769·5)	4·0 (–18·2 to 40·2)	91·8 (53·8 to 167·4)	87·6 (47·7 to 187·2)	–4·6 (–24·9 to 28·6)
Maternal disorders	**20 797·1 (19 462·4 to 22 290·3)**	**16 282·0 (14 542·5 to 18 451·2)**	**–21·7 (–30·1 to –11·7)***	**299·0 (279·8 to 320·7)**	**212·6 (189·9 to 240·9)**	**–28·9 (–36·5 to –19·8)***
Maternal haemorrhage	5614·4 (4 902·4 to 6 402·8)	4645·8 (3 769·9 to 5 636·8)	–17·3 (–28·9 to –4·6)*	81·1 (70·8 to 92·3)	60·7 (49·3 to 73·6)	–25·1 (–35·6 to –13·5)*
Maternal sepsis and other maternal infections	1443·1 (1195·4 to 1742·2)	1050·0 (792·7 to 1382·8)	–27·2 (–41·1 to –10·8)*	20·8 (17·3 to 25·1)	13·7 (10·4 to 18·0)	–34·1 (–46·8 to –19·0)*

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Maternal hypertensive disorders	3939·7 (3391·5 to 4579·2)	2938·0 (2318·0 to 3698·5)	−25·4 (−35·9 to −13·2)*	56·1 (48·3 to 65·2)	38·3 (30·2 to 48·2)	−31·7 (−41·2 to −20·7)*
Maternal obstructed labour and uterine rupture	1905·3 (1592·5 to 2242·8)	1627·1 (1257·6 to 2025·1)	−14·6 (−25·4 to −2·4)*	27·7 (23·2 to 32·5)	21·2 (16·4 to 26·4)	−23·2 (−32·9 to −12·2)*
Maternal abortion miscarriage and ectopic pregnancy	2366·6 (1992·0 to 2830·9)	1809·7 (1416·9 to 2283·6)	−23·5 (−34·2 to −12·1)*	34·0 (28·7 to 40·8)	23·6 (18·5 to 29·8)	−30·5 (−40·1 to −20·1)*
Indirect maternal deaths	2192·6 (1803·5 to 2621·7)	1744·2 (1299·7 to 2286·8)	−20·4 (−33·2 to −3·4)*	31·4 (25·9 to 37·5)	22·7 (17·0 to 29·8)	−27·6 (−39·0 to −11·9)*
Late maternal deaths	449·8 (295·7 to 652·2)	377·7 (244·8 to 562·2)	−16·0 (−26·8 to −2·6)*	6·5 (4·2 to 9·4)	4·9 (3·2 to 7·3)	−23·6 (−33·7 to −11·4)*
Maternal deaths aggravated by HIV/AIDS	149·9 (96·3 to 204·8)	122·1 (73·3 to 176·5)	−18·6 (−35·2 to 4·2)	2·2 (1·4 to 3·0)	1·6 (1·0 to 2·3)	−27·1 (−42·1 to −6·8)*
Other maternal disorders	2735·8 (2324·0 to 3245·0)	1967·5 (1578·3 to 2434·9)	−28·1 (−36·5 to −18·1)*	39·3 (33·4 to 46·6)	25·7 (20·6 to 31·7)	−34·7 (−42·4 to −26·1)*
Neonatal disorders	**239 098·4 (232 872·7 to 246 048·9)**	**197 924·8 (191 388·9 to 204 751·8)**	**−17·2 (−19·2 to −15·4)***	**3370·5 (3282·2 to 3468·1)**	**2638·3 (2551·0 to 2729·5)**	**−21·7 (−23·6 to −20·0)***
Neonatal preterm birth complications	99 050·0 (92 118·6 to 110 250·8)	74 833·6 (68 500·3 to 83 015·4)	−24·4 (−29·6 to −19·2)*	1396·6 (1298·8 to 1554·2)	997·5 (913·1 to 1106·5)	−28·6 (−33·4 to −23·6)*
Neonatal encephalopathy due to birth asphyxia and trauma	79 423·6 (72 215·4 to 87 185·6)	67 856·5 (61 497·7 to 75 824·7)	−14·6 (−21·7 to −6·7)*	1118·8 (1017·3 to 1228·6)	904·4 (819·6 to 1010·5)	−19·2 (−26·0 to −11·7)*
Neonatal sepsis and other neonatal infections	30 510·1 (21 830·7 to 40 329·6)	30 454·5 (21 591·8 to 39 747·9)	−0·2 (−16·2 to 20·3)	429·6 (307·4 to 567·7)	406·0 (287·8 to 529·8)	−5·5 (−20·6 to 13·9)
Haemolytic disease and other neonatal jaundice	6427·0 (4234·6 to 9708·3)	4504·0 (3202·7 to 6420·6)	−29·9 (−44·1 to −13·6)*	90·9 (60·0 to 137·0)	60·1 (42·7 to 85·6)	−33·9 (−47·2 to −18·6)*
Other neonatal disorders	23 687·6 (17 420·2 to 30 795·3)	20 276·2 (15 531·0 to 25 385·9)	−14·4 (−32·8 to 7·1)	334·6 (246·3 to 434·7)	270·4 (207·1 to 338·5)	−19·2 (−36·6 to 1·1)
Nutritional deficiencies	**84 133·3 (65 215·4 to 108 480·6)**	**76 517·1 (58 781·9 to 100 939·6)**	**−9·1 (−15·2 to −3·5)***	**1242·7 (964·9 to 1598·6)**	**1034·4 (795·9 to 1 363·6)**	**−16·8 (−22·4 to −11·7)***
Protein-energy malnutrition	26 655·2 (21 449·8 to 32 723·9)	21 094·0 (16 844·2 to 26 299·5)	−20·9 (−34·5 to −4·8)*	395·1 (319·4 to 484·0)	286·5 (228·9 to 356·6)	−27·5 (−39·8 to −13·0)*
Iodine deficiency	2320·5 (1500·7 to 3422·1)	2476·4 (1592·8 to 3662·1)	6·7 (3·4 to 9·9)*	35·3 (22·8 to 52·1)	33·4 (21·5 to 49·4)	−5·2 (−8·4 to −2·4)*
Vitamin A deficiency	209·5 (130·8 to 309·2)	232·4 (143·4 to 346·3)	10·9 (7·5 to 14·6)*	3·1 (2·0 to 4·6)	3·1 (1·9 to 4·7)	0·2 (−2·7 to 3·3)
Iron-deficiency anaemia	52 951·3 (36 342·0 to 74 873·5)	51 217·1 (35 014·4 to 72 661·0)	−3·3 (−4·8 to −1·8)*	778·6 (534·8 to 1 099·4)	690·8 (472·4 to 979·6)	−11·3 (−12·7 to −10·0)*
Other nutritional deficiencies	1996·8 (1378·4 to 2848·4)	1497·2 (1135·7 to 1983·7)	−25·0 (−43·3 to −9·4)*	30·5 (21·2 to 43·5)	20·5 (15·7 to 27·1)	−32·7 (−48·9 to −19·0)*
Other communicable, maternal, neonatal, and nutritional diseases	**25 182·6 (20 002·2 to 31 397·3)**	**21 792·2 (17 474·0 to 26 922·3)**	**−13·5 (−18·6 to −7·8)***	**373·1 (298·4 to 462·5)**	**293·8 (235·7 to 362·6)**	**−21·2 (−25·9 to −16·1)***
Sexually transmitted diseases excluding HIV	12 378·7 (7 831·6 to 18 396·6)	10 330·9 (6 583·0 to 15 315·1)	−16·5 (−24·2 to −8·6)*	178·7 (113·6 to 264·7)	138·1 (87·9 to 205·0)	−22·7 (−29·6 to −15·5)*
Syphilis	11 190·5 (6 607·1 to 17 280·8)	8957·1 (5273·2 to 13 969·7)	−20·0 (−28·4 to −11·8)*	160·9 (95·4 to 247·9)	120·1 (70·8 to 187·2)	−25·4 (−33·3 to −17·7)*
Chlamydial infection	337·0 (194·2 to 537·7)	369·8 (214·0 to 595·4)	9·7 (6·5 to 13·0)*	4·9 (2·8 to 7·8)	4·8 (2·8 to 7·7)	−2·3 (−5·0 to 0·5)
Gonococcal infection	382·8 (238·6 to 573·0)	469·8 (283·4 to 716·8)	22·7 (15·9 to 28·1)*	5·6 (3·5 to 8·4)	6·1 (3·7 to 9·3)	8·8 (2·8 to 13·8)*
Trichomoniasis	167·4 (67·1 to 354·8)	194·3 (77·8 to 412·1)	16·1 (15·0 to 17·2)*	2·5 (1·0 to 5·4)	2·6 (1·0 to 5·4)	1·0 (0·3 to 1·8)*
Genital herpes	197·8 (61·5 to 468·3)	236·4 (74·3 to 555·8)	19·5 (17·4 to 23·0)*	3·2 (1·0 to 7·6)	3·2 (1·0 to 7·5)	0·7 (−1·5 to 5·2)
Other sexually transmitted diseases	103·2 (74·9 to 139·2)	103·5 (74·3 to 141·2)	0·3 (−3·1 to 3·2)	1·6 (1·1 to 2·1)	1·4 (1·0 to 1·9)	−13·2 (−16·1 to −10·6)*

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Hepatitis	6042·4 (5738·7 to 6344·8)	4925·3 (4634·8 to 5229·3)	−18·5 (−22·7 to −14·1)*	93·0 (88·6 to 97·5)	66·7 (62·8 to 70·8)	−28·3 (−31·9 to −24·6)*
Acute hepatitis A	1486·6 (1058·5 to 1896·9)	1030·3 (714·9 to 1335·9)	−30·7 (−39·7 to −20·8)*	21·5 (15·2 to 27·5)	13·8 (9·6 to 17·9)	−35·6 (−43·9 to −26·4)*
Hepatitis B	2693·5 (2298·5 to 3080·0)	2449·1 (2083·5 to 2799·2)	−9·1 (−15·4 to −2·0)*	44·0 (37·8 to 50·0)	33·4 (28·5 to 38·1)	−24·1 (−29·2 to −18·6)*
Hepatitis C	98·4 (26·2 to 220·4)	89·1 (25·5 to 201·9)	−9·5 (−23·3 to 7·6)	1·6 (0·4 to 3·7)	1·2 (0·3 to 2·8)	−25·9 (−37·5 to −11·0)*
Acute hepatitis E	1763·9 (1304·1 to 2265·3)	1356·8 (972·0 to 1794·4)	−23·1 (−31·6 to −14·0)*	25·9 (19·0 to 33·7)	18·3 (13·1 to 24·2)	−29·6 (−37·1 to −21·6)*
Other infectious diseases	6761·5 (4784·8 to 8106·7)	6536·0 (4527·7 to 7935·6)	−3·3 (−13·9 to 9·2)	101·3 (72·0 to 120·9)	89·0 (61·6 to 107·8)	−12·2 (−21·6 to −1·0)*
Non-communicable diseases	**1 322 207·9 (1 181 179·7 to 1 471 448·8)**	**1 473 508·2 (1 309 803·2 to 1 650 147·4)**	**11·4 (9·7 to 13·0)***	**23 220·2 (20 898·5 to 25 689·0)**	**21 062·4 (18 790·6 to 23 518·0)**	**−9·3 (−10·9 to −7·9)***
Neoplasms	**187 562·1 (183 699·7 to 191 539·2)**	**209 359·2 (204 155·5 to 214 470·1)**	**11·6 (9·3 to 14·2)***	**3424·3 (3356·2 to 3494·4)**	**3024·4 (2949·8 to 3098·9)**	**−11·7 (−13·4 to −9·7)***
Lip and oral cavity cancer	2954·1 (2866·9 to 3050·0)	3780·1 (3645·7 to 3928·9)	28·0 (23·9 to 32·6)*	53·7 (52·1 to 55·4)	53·7 (51·8 to 55·8)	0·1 (−3·1 to 3·7)
Nasopharynx cancer	1805·8 (1477·1 to 1912·4)	1911·7 (1562·1 to 2040·2)	5·9 (−2·2 to 12·4)	30·9 (25·4 to 32·7)	26·5 (21·6 to 28·2)	−14·3 (−20·6 to −9·0)*
Other pharynx cancer	1419·9 (1374·7 to 1468·8)	1715·7 (1635·4 to 1795·0)	20·8 (15·2 to 26·3)*	25·9 (25·1 to 26·8)	24·3 (23·2 to 25·4)	−6·3 (−10·7 to −2·1)*
Oesophageal cancer	10 665·4 (10 313·5 to 11 043·9)	9 854·4 (9 465·3 to 10 270·8)	−7·6 (−12·4 to −2·1)*	201·0 (194·5 to 207·8)	143·6 (137·9 to 149·5)	−28·6 (−32·2 to −24·4)*
Stomach cancer	18 665·9 (18 186·3 to 19 175·5)	17 439·6 (16 876·7 to 18 034·6)	−6·6 (−9·7 to −3·3)*	350·6 (341·9 to 360·0)	255·9 (247·9 to 264·5)	−27·0 (−29·4 to −24·5)*
Colon and rectum cancer	14 409·5 (14 108·0 to 14 779·0)	17 026·6 (16 586·7 to 17 504·7)	18·2 (15·7 to 20·9)*	274·0 (268·2 to 280·8)	251·3 (244·9 to 258·4)	−8·3 (−10·2 to −6·2)*
Liver cancer	19 643·6 (16 871·4 to 20 641·2)	20 578·0 (18 937·8 to 21 915·3)	4·8 (−1·4 to 15·5)	350·9 (302·8 to 368·5)	292·1 (269·1 to 311·0)	−16·8 (−21·4 to −8·7)*
Liver cancer due to hepatitis B	8420·5 (7092·2 to 9020·2)	8029·5 (7279·6 to 8795·5)	−4·6 (−11·2 to 8·2)	143·4 (121·3 to 153·7)	110·6 (100·4 to 121·2)	−22·9 (−27·9 to −12·9)*
Liver cancer due to hepatitis C	2897·4 (2607·7 to 3109·1)	3324·0 (3012·2 to 3573·6)	14·7 (10·3 to 20·2)*	55·5 (50·1 to 59·5)	49·3 (44·9 to 52·9)	−11·2 (−14·4 to −7·1)*
Liver cancer due to alcohol use	4786·9 (4075·0 to 5168·7)	5888·5 (5368·4 to 6441·0)	23·0 (14·8 to 36·1)*	89·2 (76·2 to 96·3)	84·8 (77·5 to 92·7)	−4·9 (−11·1 to 4·8)
Liver cancer due to other causes	3538·8 (3022·8 to 3829·6)	3336·0 (3019·1 to 3637·7)	−5·7 (−11·2 to 3·8)	62·9 (54·1 to 68·1)	47·4 (42·9 to 51·6)	−24·6 (−28·9 to −17·5)*
Gallbladder and biliary tract cancer	2448·7 (2359·2 to 2524·3)	2615·7 (2454·6 to 2740·8)	6·8 (2·2 to 11·6)*	47·3 (45·7 to 48·7)	39·0 (36·7 to 40·9)	−17·5 (−21·0 to −13·8)*
Pancreatic cancer	6528·1 (6433·9 to 6630·7)	8236·6 (8064·7 to 8420·0)	26·2 (23·3 to 29·0)*	125·2 (123·4 to 127·0)	121·8 (119·3 to 124·4)	−2·7 (−4·8 to −0·6)*
Larynx cancer	2364·1 (2290·8 to 2443·5)	2608·5 (2518·3 to 2705·0)	10·3 (7·1 to 13·9)*	44·0 (42·7 to 45·5)	37·6 (36·3 to 39·0)	−14·5 (−17·0 to −11·8)*
Tracheal, bronchus, and lung cancer	31 802·0 (31 117·2 to 32 516·2)	36 419·5 (35 356·6 to 37 615·6)	14·5 (11·0 to 19·1)*	604·5 (591·8 to 617·4)	535·9 (520·3 to 553·1)	−11·3 (−14·0 to −7·9)*
Malignant skin melanoma	1304·0 (1086·8 to 1655·2)	1596·3 (1293·4 to 1982·7)	22·4 (15·6 to 27·5)*	23·3 (19·4 to 29·6)	22·8 (18·4 to 28·3)	−2·3 (−7·7 to 1·7)
Non-melanoma skin cancer	794·3 (764·9 to 828·0)	1088·8 (1028·3 to 1150·1)	37·1 (32·0 to 41·9)*	15·2 (14·7 to 15·9)	16·3 (15·4 to 17·2)	6·8 (2·8 to 10·6)*
Non-melanoma skin cancer (squamous-cell carcinoma)	789·6 (761·2 to 822·3)	1082·9 (1025·0 to 1142·0)	37·1 (32·0 to 42·0)*	15·1 (14·6 to 15·8)	16·2 (15·3 to 17·1)	6·9 (2·9 to 10·6)*
Non-melanoma skin cancer (basal-cell carcinoma)	4·7 (2·2 to 8·7)	6·0 (2·8 to 11·1)	26·9 (23·4 to 30·2)*	0·1 (0·0 to 0·2)	0·1 (0·0 to 0·2)	−3·8 (−6·5 to −1·2)*

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Breast cancer	12 939·2 (12 181·7 to 13 828·7)	15 410·6 (14 415·5 to 16 217·8)	19·1 (11·6 to 25·8)*	231·4 (218·3 to 246·9)	217·1 (203·2 to 228·7)	−6·2 (−11·9 to −1·1)*
Cervical cancer	6819·2 (6393·4 to 7236·4)	6963·0 (6526·2 to 7408·0)	2·1 (−4·5 to 10·5)	118·9 (111·8 to 126·1)	96·7 (90·7 to 102·7)	−18·7 (−23·9 to −12·2)*
Uterine cancer	2077·7 (1963·6 to 2201·8)	2230·7 (2098·3 to 2386·9)	7·4 (0·3 to 15·8)*	38·7 (36·6 to 40·9)	32·2 (30·3 to 34·5)	−16·6 (−22·0 to −10·1)*
Ovarian cancer	3496·3 (3401·0 to 3660·5)	4135·9 (3992·4 to 4298·0)	18·3 (13·4 to 23·1)*	63·2 (61·5 to 66·0)	58·6 (56·6 to 60·8)	−7·3 (−11·0 to −3·8)*
Prostate cancer	4793·4 (3992·1 to 6079·2)	6281·2 (5233·9 to 7904·2)	31·0 (26·9 to 35·2)*	100·0 (83·5 to 126·8)	99·6 (83·0 to 125·7)	−0·4 (−3·5 to 2·6)
Testicular cancer	411·3 (390·2 to 435·8)	442·6 (413·1 to 473·3)	7·6 (0·3 to 13·6)*	6·3 (6·0 to 6·7)	5·9 (5·5 to 6·3)	−6·4 (−12·6 to −1·2)*
Kidney cancer	2649·3 (2539·2 to 2779·3)	3340·3 (3189·6 to 3513·2)	26·1 (21·2 to 30·6)*	48·5 (46·8 to 50·6)	48·4 (46·2 to 50·8)	−0·3 (−3·8 to 3·0)
Bladder cancer	2832·7 (2754·6 to 2908·1)	3368·8 (3251·3 to 3496·5)	18·9 (15·4 to 22·4)*	56·3 (54·8 to 57·8)	51·3 (49·5 to 53·2)	−8·8 (−11·5 to −6·2)*
Brain and nervous system cancer	6738·3 (6079·6 to 7270·6)	7624·4 (6975·3 to 8218·8)	13·2 (5·0 to 21·0)*	111·4 (100·8 to 119·7)	105·6 (96·7 to 113·7)	−5·2 (−11·7 to 1·2)
Thyroid cancer	649·6 (605·3 to 707·6)	846·3 (754·1 to 929·0)	30·3 (19·2 to 37·4)*	12·1 (11·3 to 13·2)	12·4 (11·1 to 13·6)	2·2 (−6·2 to 7·8)
Mesothelioma	544·9 (529·2 to 560·6)	701·9 (678·8 to 722·2)	28·8 (24·3 to 33·3)*	10·1 (9·8 to 10·3)	10·3 (9·9 to 10·5)	2·0 (−1·5 to 5·4)
Hodgkin's lymphoma	949·3 (837·3 to 1120·9)	845·6 (758·4 to 1031·7)	−10·9 (−14·9 to −6·7)*	15·5 (13·7 to 18·3)	11·6 (10·5 to 14·2)	−24·7 (−28·2 to −21·1)*
Non-Hodgkin lymphoma	5063·1 (4581·8 to 5581·3)	6283·8 (5449·8 to 6632·3)	24·1 (11·5 to 31·7)*	88·3 (79·7 to 96·6)	89·5 (77·5 to 94·3)	1·3 (−8·5 to 7·0)
Multiple myeloma	1694·3 (1646·6 to 1751·4)	2182·4 (2096·5 to 2255·8)	28·8 (23·8 to 33·2)*	32·2 (31·2 to 33·2)	32·1 (30·8 to 33·1)	−0·4 (−4·1 to 2·9)
Leukaemia	11 272·2 (10 956·3 to 11 683·7)	12 040·4 (11 609·8 to 12 499·3)	6·8 (2·9 to 10·5)*	181·6 (176·6 to 187·8)	167·7 (161·8 to 173·9)	−7·6 (−10·8 to −4·6)*
Acute lymphoid leukaemia	4857·0 (4505·3 to 5452·8)	5057·8 (4658·4 to 5507·7)	4·1 (−1·7 to 9·9)	73·6 (68·3 to 82·4)	69·1 (63·6 to 75·2)	−6·1 (−11·3 to −1·0)*
Chronic lymphoid leukaemia	1183·2 (1107·9 to 1256·6)	1268·6 (1194·2 to 1349·3)	7·2 (1·8 to 12·8)*	21·8 (20·5 to 23·1)	18·7 (17·7 to 19·9)	−14·1 (−18·3 to −10·0)*
Acute myeloid leukaemia	4199·7 (3770·1 to 4553·5)	4769·0 (4345·7 to 5193·7)	13·6 (8·2 to 18·5)*	68·5 (62·1 to 74·0)	66·6 (60·8 to 72·5)	−2·8 (−7·0 to 1·1)
Chronic myeloid leukaemia	1032·3 (957·8 to 1131·8)	945·1 (885·8 to 1032·9)	−8·5 (−12·3 to −3·8)*	17·7 (16·5 to 19·3)	13·3 (12·5 to 14·5)	−24·8 (−27·8 to −21·2)*
Other neoplasms	9825·9 (9023·1 to 10 351·7)	11 789·9 (10 528·0 to 12 616·2)	20·0 (13·4 to 25·7)*	163·3 (150·1 to 171·6)	164·6 (146·8 to 175·8)	0·8 (−4·5 to 5·5)
Cardiovascular diseases	**326 252·4 (318 365·8 to 334 285·8)**	**347 528·9 (337 220·3 to 358 093·5)**	**6·5 (4·1 to 8·7)***	**6231·9 (6086·8 to 6378·1)**	**5179·7 (5026·3 to 5334·2)**	**−16·9 (−18·7 to −15·3)***
Rheumatic heart disease	11 594·7 (10 668·9 to 12 707·4)	10 513·2 (9 611·0 to 11 514·5)	−9·3 (−13·3 to −5·7)*	193·6 (178·4 to 210·6)	146·6 (134·2 to 160·1)	−24·3 (−27·5 to −21·3)*
Ischaemic heart disease	147 780·0 (144 845·9 to 151 651·5)	164 020·4 (159 621·3 to 169 088·2)	11·0 (8·3 to 13·3)*	2860·0 (2805·1 to 2927·3)	2452·6 (2388·9 to 2526·8)	−14·2 (−16·2 to −12·5)*
Cerebrovascular disease	118 566·2 (115 776·1 to 121 419·2)	118 626·7 (114 862·4 to 122 627·0)	0·1 (−2·5 to 2·7)	2283·2 (2230·3 to 2335·8)	1776·6 (1721·1 to 1834·8)	−22·2 (−24·1 to −20·1)*
Ischaemic stroke	44 104·6 (42 363·3 to 45 822·3)	45 208·5 (43 150·2 to 47 386·8)	2·5 (−0·4 to 5·2)	903·6 (869·6 to 936·9)	706·2 (675·6 to 739·0)	−21·8 (−24·0 to −19·8)*
Haemorrhagic stroke	74 461·5 (72 176·9 to 76 874·3)	73 418·2 (70 737·2 to 76 596·4)	−1·4 (−4·6 to 2·1)	1379·6 (1337·6 to 1423·6)	1070·4 (1032·1 to 1116·3)	−22·4 (−25·0 to −19·6)*
Hypertensive heart disease	14 852·4 (13 919·4 to 16 052·6)	17 484·6 (16 286·9 to 18 593·6)	17·7 (11·6 to 22·9)*	286·5 (268·8 to 309·8)	262·2 (243·2 to 279·1)	−8·5 (−13·4 to −4·5)*

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Cardiomyopathy and myocarditis	9619·8 (9134·6 to 9993·7)	9220·3 (8765·6 to 9706·0)	−4·2 (−8·3 to −0·1)*	163·4 (155·8 to 169·5)	130·0 (123·7 to 136·7)	−20·5 (−23·7 to −17·2)*
Atrial fibrillation and flutter	3463·2 (2764·5 to 4281·3)	4433·7 (3541·7 to 5489·1)	28·0 (26·6 to 29·3)*	73·8 (59·3 to 90·5)	70·6 (56·5 to 86·9)	−4·2 (−5·3 to −3·3)*
Aortic aneurysm	2468·0 (2403·2 to 2547·3)	2930·2 (2846·0 to 3007·0)	18·7 (12·9 to 22·6)*	47·6 (46·4 to 49·1)	43·8 (42·6 to 45·0)	−7·9 (−12·3 to −5·0)*
Peripheral vascular disease	913·0 (686·4 to 1279·3)	1198·8 (898·0 to 1682·6)	31·3 (27·7 to 35·2)*	19·3 (14·5 to 26·9)	19·1 (14·3 to 26·8)	−1·1 (−3·9 to 1·7)
Endocarditis	1962·3 (1616·0 to 2190·5)	2210·3 (1838·9 to 2421·3)	12·6 (6·3 to 18·8)*	33·0 (27·7 to 36·7)	31·2 (26·1 to 34·2)	−5·5 (−10·2 to −0·9)*
Other cardiovascular and circulatory diseases	15 032·7 (13 427·8 to 16 820·7)	16 890·7 (14 824·7 to 19 104·2)	12·4 (8·4 to 15·6)*	271·6 (243·4 to 303·7)	247·0 (217·2 to 279·2)	−9·0 (−12·1 to −6·5)*
Chronic respiratory diseases	**97 356·3 (90 607·8 to 104 559·9)**	**97 451·8 (89 829·7 to 105 527·6)**	**0·1 (−2·4 to 2·6)**	**1802·0 (1694·4 to 1915·3)**	**1443·4 (1336·9 to 1556·8)**	**−19·9 (−22·2 to −17·8)***
Chronic obstructive pulmonary disease	63 773·8 (60 981·4 to 66 186·6)	63 850·4 (61 215·3 to 66 288·6)	0·1 (−3·1 to 3·8)	1246·9 (1195·2 to 1291·9)	971·1 (932·7 to 1 007·6)	−22·1 (−24·6 to −19·2)*
Pneumoconiosis	976·7 (816·2 to 1 168·6)	1 099·6 (902·7 to 1 314·7)	12·6 (6·9 to 18·9)*	17·8 (15·0 to 21·1)	16·0 (13·2 to 19·1)	−9·9 (−14·8 to −4·7)*
Silicosis	271·5 (240·1 to 308·1)	270·2 (235·8 to 310·1)	−0·5 (−10·1 to 11·5)	5·0 (4·5 to 5·7)	4·0 (3·5 to 4·5)	−21·3 (−28·7 to −12·0)*
Asbestosis	76·3 (63·0 to 87·9)	92·0 (75·3 to 107·2)	20·5 (13·7 to 27·8)*	1·4 (1·2 to 1·6)	1·4 (1·1 to 1·6)	−3·8 (−8·9 to 1·7)
Coal worker's pneumoconiosis	59·7 (52·8 to 67·4)	57·5 (49·0 to 67·2)	−3·6 (−17·4 to 9·4)	1·2 (1·0 to 1·3)	0·9 (0·7 to 1·0)	−25·1 (−35·6 to −15·1)*
Other pneumoconiosis	569·3 (440·2 to 715·7)	680·0 (526·2 to 855·9)	19·5 (13·4 to 25·9)*	10·2 (8·0 to 12·7)	9·8 (7·6 to 12·3)	−3·4 (−9·0 to 2·3)
Asthma	26 859·7 (21 268·1 to 33 122·5)	26 168·8 (20 501·4 to 32 583·0)	−2·6 (−9·2 to 4·2)	439·8 (351·4 to 537·5)	365·6 (287·5 to 453·5)	−16·9 (−23·5 to −10·3)*
Interstitial lung disease and pulmonary sarcoidosis	1672·3 (1351·2 to 1954·1)	2352·6 (1933·8 to 2618·7)	40·7 (29·2 to 48·8)*	32·0 (25·7 to 37·2)	35·4 (28·9 to 39·3)	10·3 (1·5 to 16·7)*
Other chronic respiratory diseases	4073·7 (3295·2 to 4805·9)	3980·4 (3225·6 to 4569·7)	−2·3 (−11·0 to 7·3)	65·5 (53·3 to 76·6)	55·4 (44·9 to 63·5)	−15·3 (−22·4 to −7·5)*
Cirrhosis and other chronic liver diseases	**37 101·5 (35 722·1 to 39 385·8)**	**38 973·3 (37 202·0 to 41 702·9)**	**5·0 (1·6 to 8·7)***	**632·5 (609·4 to 669·2)**	**539·6 (515·4 to 576·8)**	**−14·7 (−17·4 to −11·8)***
Cirrhosis and other chronic liver diseases due to hepatitis B	10 297·6 (9 495·9 to 11 233·5)	10 754·7 (9 876·8 to 11 957·6)	4·4 (0·2 to 8·6)*	178·0 (164·1 to 194·8)	149·5 (137·3 to 165·9)	−16·0 (−19·2 to −12·7)*
Cirrhosis and other chronic liver diseases due to hepatitis C	8408·4 (7768·6 to 9069·5)	9161·7 (8443·3 to 9968·2)	9·0 (5·7 to 12·3)*	146·5 (135·6 to 157·9)	127·4 (117·6 to 138·4)	−13·0 (−15·6 to −10·4)*
Cirrhosis and other chronic liver diseases due to alcohol use	10 093·5 (9 424·0 to 10 841·4)	10 997·4 (10 197·4 to 11 875·1)	9·0 (5·0 to 13·7)*	171·9 (160·5 to 184·3)	150·7 (139·7 to 162·6)	−12·3 (−15·5 to −8·6)*
Cirrhosis and other chronic liver diseases due to other causes	8302·1 (7741·5 to 9165·9)	8059·5 (7452·2 to 8977·7)	−2·9 (−6·5 to 1·3)	136·1 (126·8 to 149·9)	112·0 (103·6 to 124·7)	−17·7 (−20·6 to −14·3)*
Digestive diseases	**41 351·8 (37 701·8 to 45 778·3)**	**42 189·1 (38 101·1 to 47 087·5)**	**2·0 (−2·7 to 6·2)**	**716·3 (653·0 to 793·4)**	**600·3 (542·1 to 670·1)**	**−16·2 (−19·7 to −12·9)***
Peptic ulcer disease	10 164·0 (9220·6 to 11 279·2)	8894·4 (7950·0 to 10 039·2)	−12·5 (−17·7 to −5·9)*	180·8 (163·9 to 201·3)	128·5 (114·6 to 145·3)	−28·9 (−33·2 to −23·6)*
Gastritis and duodenitis	5757·0 (4331·9 to 7638·9)	6145·5 (4517·3 to 8251·9)	6·7 (2·5 to 11·1)*	100·9 (76·0 to 134·0)	87·8 (64·6 to 118·0)	−13·1 (−16·4 to −9·7)*
Appendicitis	2197·3 (1823·7 to 2661·6)	2015·9 (1631·6 to 2381·2)	−8·3 (−21·5 to 6·4)	34·4 (28·7 to 41·2)	27·6 (22·4 to 32·6)	−19·6 (−30·7 to −6·8)*
Paralytic ileus and intestinal obstruction	6957·0 (6123·4 to 8236·1)	7135·5 (6464·3 to 8502·6)	2·6 (−5·5 to 11·2)	117·3 (104·1 to 138·5)	100·7 (91·4 to 119·7)	−14·2 (−20·1 to −7·5)*
Inguinal femoral and abdominal hernia	1689·6 (1147·1 to 1996·2)	1645·7 (1089·7 to 1969·1)	−2·6 (−9·8 to 7·0)	29·2 (20·1 to 34·2)	23·4 (15·6 to 27·9)	−19·7 (−26·1 to −11·8)*

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Inflammatory bowel disease	3222·5 (2514·5 to 4041·9)	3588·0 (2797·3 to 4483·0)	11·3 (5·1 to 15·4)*	53·8 (42·3 to 67·1)	49·8 (39·0 to 62·0)	−7·5 (−12·2 to −4·3)*
Vascular intestinal disorders	1475·6 (1358·6 to 1619·3)	1741·6 (1607·3 to 1903·4)	18·0 (12·8 to 23·7)*	28·8 (26·6 to 31·5)	26·5 (24·5 to 28·8)	−8·2 (−12·2 to −3·9)*
Gallbladder and biliary diseases	2706·6 (2459·3 to 2994·3)	2878·7 (2597·4 to 3161·8)	6·4 (−0·2 to 11·9)	48·3 (44·1 to 53·0)	41·6 (37·6 to 45·6)	−13·8 (−18·7 to −9·6)*
Pancreatitis	3765·2 (3501·1 to 4071·3)	4373·2 (4000·1 to 4766·0)	16·1 (9·2 to 23·2)*	62·8 (58·5 to 67·8)	60·2 (55·1 to 65·5)	−4·1 (−9·6 to 1·6)
Other digestive diseases	3417·0 (2883·7 to 4228·0)	3770·5 (3180·0 to 4438·8)	10·3 (−0·1 to 22·2)	60·0 (51·0 to 73·9)	54·2 (45·9 to 63·7)	−9·7 (−18·0 to −0·4)*
Neurological disorders	**74 456·9 (58 081·0 to 93 693·7)**	**87 082·1 (67 962·4 to 109 039·4)**	**17·0 (15·5 to 18·5)***	**1291·0 (1025·5 to 1596·9)**	**1252·4 (987·9 to 1556·6)**	**−3·0 (−4·2 to −2·0)***
Alzheimer's disease and other dementias	17 905·9 (15 147·4 to 20 849·2)	23 779·2 (20 118·0 to 27 886·0)	32·8 (31·2 to 34·4)*	409·6 (348·0 to 479·2)	395·6 (333·5 to 463·8)	−3·4 (−4·4 to −2·5)*
Parkinson's disease	1548·9 (1381·7 to 1747·5)	2059·3 (1831·8 to 2320·9)	32·9 (29·7 to 35·7)*	32·8 (29·4 to 36·8)	33·1 (29·5 to 37·2)	1·1 (−1·3 to 3·1)
Epilepsy	12 892·1 (10 694·5 to 15 020·3)	12 417·9 (10 438·3 to 14 478·8)	−3·7 (−8·6 to 1·3)	194·1 (160·8 to 226·1)	167·6 (140·8 to 195·3)	−13·7 (−17·9 to −9·3)*
Multiple sclerosis	1076·7 (913·9 to 1248·8)	1233·7 (1033·4 to 1436·9)	14·6 (9·9 to 18·4)*	18·1 (15·4 to 21·0)	16·9 (14·2 to 19·7)	−6·6 (−10·3 to −3·6)*
Motor neuron disease	759·2 (728·7 to 806·3)	910·0 (872·2 to 958·5)	19·9 (13·6 to 23·2)*	13·6 (13·1 to 14·4)	13·1 (12·5 to 13·8)	−3·9 (−9·0 to −1·3)*
Migraine	28 538·7 (17 584·9 to 42 479·8)	32 898·8 (20 294·8 to 48 945·4)	15·3 (14·0 to 16·6)*	435·2 (268·4 to 647·8)	438·7 (271·0 to 653·8)	0·8 (−0·1 to 1·8)
Tension-type headache	1961·3 (915·9 to 3647·4)	2260·5 (1054·6 to 4193·3)	15·3 (14·0 to 16·7)*	30·0 (14·0 to 55·5)	30·2 (14·1 to 56·0)	0·6 (−0·1 to 1·3)
Medication overuse headache	7705·4 (5100·2 to 10997·3)	9164·7 (6089·3 to 13080·8)	18·9 (15·4 to 22·8)*	123·0 (82·3 to 175·3)	123·7 (82·2 to 177·0)	0·6 (−2·3 to 3·5)
Other neurological disorders	2070·4 (1941·6 to 2302·3)	2359·5 (2216·5 to 2565·4)	14·0 (9·4 to 17·5)*	34·6 (32·2 to 38·0)	33·6 (31·3 to 36·4)	−3·1 (−6·4 to −0·4)*
Mental and substance use disorders	**141 375·1 (105 843·7 to 178 447·3)**	**162 442·3 (121 032·0 to 205 579·7)**	**14·9 (14·1 to 15·7)***	**2189·2 (1646·0 to 2762·8)**	**2183·3 (1627·1 to 2766·3)**	**−0·3 (−1·0 to 0·3)**
Schizophrenia	13 185·0 (9 635·3 to 16 203·0)	15 516·1 (11 279·2 to 19 137·0)	17·7 (16·5 to 18·8)*	210·4 (154·7 to 258·4)	207·5 (151·1 to 255·5)	−1·4 (−2·4 to −0·5)*
Alcohol use disorders	11 566·7 (9 617·6 to 13 834·9)	11 194·3 (9 136·5 to 13 870·9)	−3·2 (−7·0 to 0·6)	183·4 (153·5 to 218·3)	149·4 (122·1 to 184·8)	−18·5 (−22·0 to −15·1)*
Drug use disorders	13 671·4 (11 292·6 to 16 046·0)	16 909·5 (14 037·6 to 19 871·6)	23·7 (18·6 to 27·2)*	207·2 (171·5 to 242·7)	223·5 (185·8 to 262·2)	7·9 (3·5 to 10·9)*
Opioid use disorders	9864·0 (8127·4 to 11516·8)	12 068·1 (9 878·0 to 14 145·1)	22·3 (17·5 to 26·1)*	150·2 (123·7 to 175·3)	159·3 (130·7 to 186·6)	6·0 (1·8 to 9·2)*
Cocaine use disorders	729·3 (558·4 to 902·4)	999·3 (773·5 to 1 233·9)	37·0 (29·2 to 47·0)*	11·3 (8·7 to 14·0)	13·4 (10·4 to 16·6)	18·7 (12·1 to 27·3)*
Amphetamine use disorders	1001·3 (706·2 to 1348·3)	1402·6 (1025·2 to 1846·9)	40·1 (26·1 to 55·2)*	14·6 (10·4 to 19·6)	18·4 (13·5 to 24·2)	25·8 (13·3 to 39·4)*
Cannabis use disorders	548·1 (351·9 to 780·7)	577·2 (371·8 to 817·6)	5·3 (3·7 to 7·1)*	7·9 (5·0 to 11·2)	7·6 (4·9 to 10·7)	−3·7 (−5·0 to −2·3)*
Other drug use disorders	1528·7 (1245·5 to 1861·2)	1862·2 (1501·6 to 2274·2)	21·8 (15·7 to 27·5)*	23·1 (19·0 to 28·0)	24·8 (20·0 to 30·2)	7·1 (1·7 to 12·0)*
Depressive disorders	45 916·0 (31 684·6 to 61 591·2)	54 255·4 (37 513·6 to 72 968·9)	18·2 (17·2 to 19·2)*	726·9 (503·8 to 975·9)	734·2 (508·2 to 986·9)	1·0 (0·5 to 1·5)*
Major depressive disorder	37 544·8 (24 983·0 to 51 134·6)	44 224·4 (29 542·6 to 60 430·5)	17·8 (16·6 to 19·0)*	590·9 (395·0 to 804·5)	597·2 (399·6 to 816·6)	1·1 (0·5 to 1·7)*
Dysthymia	8 371·3 (5 537·6 to 11 983·7)	10 031·0 (6 604·4 to 14 289·3)	19·8 (18·3 to 21·5)*	136·1 (89·8 to 194·6)	137·0 (90·0 to 195·3)	0·7 (−0·2 to 1·6)

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Bipolar disorder	7838·8 (4787·8 to 11674·9)	9004·7 (5501·3 to 13396·4)	14·9 (13·9 to 15·9)*	119·0 (72·8 to 176·9)	119·6 (73·2 to 177·8)	0·5 (0·0 to 0·9)
Anxiety disorders	21474·8 (14666·7 to 29339·6)	24643·0 (16799·8 to 33714·1)	14·8 (12·8 to 16·6)*	329·2 (225·4 to 448·4)	332·4 (227·0 to 453·8)	1·0 (–0·4 to 2·3)
Eating disorders	1198·1 (806·7 to 1669·8)	1421·7 (950·5 to 1978·6)	18·7 (16·5 to 20·8)*	17·1 (11·5 to 23·7)	18·7 (12·5 to 26·0)	9·6 (7·7 to 11·4)*
Anorexia nervosa	584·9 (396·7 to 829·1)	653·0 (439·3 to 929·4)	11·7 (8·7 to 14·6)*	8·2 (5·6 to 11·6)	8·6 (5·8 to 12·2)	4·6 (1·8 to 7·4)*
Bulimia nervosa	613·3 (394·9 to 892·6)	768·7 (493·0 to 1113·8)	25·3 (23·2 to 27·6)*	8·8 (5·7 to 12·9)	10·1 (6·5 to 14·6)	14·2 (12·2 to 16·2)*
Autistic spectrum disorders	8949·8 (5978·1 to 12300·4)	10051·5 (6718·9 to 13804·4)	12·3 (11·9 to 12·8)*	134·7 (90·1 to 185·0)	135·5 (90·6 to 186·0)	0·6 (0·2 to 0·9)*
Autism	5632·7 (3617·2 to 7920·0)	6335·9 (4070·1 to 8919·0)	12·5 (11·9 to 13·1)*	84·8 (54·5 to 119·2)	85·4 (54·9 to 120·3)	0·7 (0·2 to 1·2)*
Asperger syndrome and other autistic spectrum disorders	3317·1 (2204·2 to 4849·0)	3715·6 (2467·7 to 5435·2)	12·0 (11·5 to 12·5)*	49·9 (33·2 to 72·9)	50·1 (33·3 to 73·2)	0·3 (–0·1 to 0·7)
Attention-deficit hyperactivity disorder	617·9 (368·9 to 946·0)	620·1 (369·8 to 948·7)	0·4 (–0·6 to 1·2)	8·6 (5·1 to 13·2)	8·3 (5·0 to 12·7)	–3·5 (–4·4 to –2·8)*
Conduct disorder	5740·5 (3459·2 to 8923·4)	5770·5 (3471·8 to 8956·9)	0·5 (–0·3 to 1·4)	78·2 (47·2 to 121·3)	79·3 (47·7 to 123·1)	1·4 (0·7 to 2·0)*
Idiopathic developmental intellectual disability	3119·9 (1386·3 to 5416·5)	3442·1 (1503·1 to 5999·6)	10·3 (8·2 to 11·4)*	46·0 (20·4 to 80·0)	46·2 (20·1 to 80·5)	0·2 (–1·5 to 1·2)
Other mental and substance use disorders	8095·9 (5632·9 to 10919·3)	9613·4 (6698·4 to 12966·0)	18·7 (17·7 to 19·8)*	128·4 (89·5 to 172·8)	128·8 (89·8 to 173·6)	0·3 (–0·6 to 1·1)
Diabetes, urogenital, blood, and endocrine diseases	**122917·1 (106347·2 to 142775·0)**	**146780·6 (126480·8 to 171189·3)**	**19·4 (16·4 to 22·5)***	**2123·6 (1847·2 to 2453·9)**	**2086·8 (1803·2 to 2422·8)**	**–1·7 (–4·0 to 0·6)**
Diabetes mellitus	49724·5 (41868·2 to 58982·1)	64134·5 (53489·7 to 76112·8)	29·0 (26·2 to 31·7)*	911·2 (772·1 to 1076·0)	925·8 (776·1 to 1096·3)	1·6 (–0·5 to 3·7)
Acute glomerulonephritis	412·3 (321·1 to 459·3)	337·9 (228·4 to 378·2)	–18·1 (–31·7 to –10·4)*	6·9 (5·4 to 7·7)	4·8 (3·2 to 5·3)	–30·6 (–42·4 to –24·1)*
Chronic kidney disease	29488·3 (26950·4 to 31604·2)	35259·7 (32008·1 to 37763·0)	19·6 (16·0 to 23·2)*	524·4 (482·1 to 561·0)	508·8 (462·1 to 545·1)	–3·0 (–5·8 to –0·1)*
Chronic kidney disease due to diabetes mellitus	8713·0 (7991·5 to 9466·3)	11258·0 (10302·9 to 12225·2)	29·2 (25·9 to 32·5)*	159·0 (146·2 to 172·6)	163·3 (149·6 to 177·1)	2·7 (0·2 to 5·3)*
Chronic kidney disease due to hypertension	10366·1 (9400·8 to 10985·1)	12737·4 (11488·7 to 13553·9)	22·9 (18·6 to 27·4)*	188·4 (172·1 to 199·7)	186·1 (168·1 to 197·9)	–1·2 (–4·6 to 2·3)
Chronic kidney disease due to glomerulonephritis	7720·0 (6930·5 to 8332·1)	8136·0 (7294·2 to 8861·4)	5·4 (1·3 to 9·3)*	130·7 (117·3 to 140·8)	114·6 (103·0 to 124·6)	–12·3 (–15·6 to –9·0)*
Chronic kidney disease due to other causes	2689·3 (2208·6 to 3237·9)	3128·3 (2517·9 to 3802·9)	16·3 (13·1 to 19·2)*	46·3 (37·7 to 55·8)	44·7 (36·0 to 54·1)	–3·4 (–5·6 to –1·5)*
Urinary diseases and male infertility	7958·9 (6720·4 to 9447·1)	9653·3 (8096·4 to 11537·2)	21·3 (17·2 to 24·8)*	147·3 (123·4 to 175·7)	142·5 (119·0 to 170·6)	–3·3 (–6·3 to –0·5)*
Interstitial nephritis and urinary tract infections	3399·6 (3134·3 to 3743·4)	3950·3 (3625·0 to 4408·2)	16·2 (11·4 to 21·5)*	60·6 (56·1 to 66·3)	57·6 (52·8 to 63·9)	–5·0 (–9·0 to –0·3)*
Urolithiasis	448·5 (382·6 to 535·4)	456·1 (398·9 to 568·2)	1·7 (–4·7 to 10·8)	7·9 (6·7 to 9·4)	6·5 (5·7 to 8·1)	–17·3 (–22·5 to –9·6)*
Benign prostatic hyperplasia	2922·0 (1867·0 to 4187·6)	3792·7 (2419·5 to 5453·5)	29·8 (27·6 to 32·2)*	58·6 (37·5 to 84·1)	57·9 (37·1 to 82·9)	–1·3 (–2·8 to 0·3)
Male infertility	141·8 (57·7 to 293·6)	173·9 (69·7 to 365·9)	22·7 (19·2 to 25·9)*	2·1 (0·8 to 4·3)	2·3 (0·9 to 4·8)	9·8 (6·9 to 12·5)*
Other urinary diseases	1047·1 (861·6 to 1213·3)	1280·2 (1044·9 to 1424·5)	22·3 (10·3 to 36·4)*	18·2 (15·1 to 21·1)	18·2 (14·9 to 20·2)	0·2 (–9·9 to 11·5)
Gynaecological diseases	9292·8 (6396·3 to 13190·5)	10255·1 (7041·0 to 14603·3)	10·4 (9·0 to 11·7)*	140·3 (96·5 to 199·6)	134·9 (92·6 to 192·2)	–3·8 (–4·9 to –2·8)*

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Uterine fibroids	2212·2 (1393·2 to 3481·1)	2452·6 (1514·9 to 3914·8)	10·9 (8·3 to 13·1)*	34·6 (21·7 to 54·4)	32·4 (20·0 to 51·8)	−6·1 (−8·1 to −4·4)*
Polycystic ovarian syndrome	514·7 (245·2 to 972·0)	560·0 (263·4 to 1068·1)	8·8 (4·8 to 10·9)*	7·5 (3·6 to 14·2)	7·4 (3·5 to 14·0)	−2·6 (−6·5 to −0·6)*
Female infertility	275·6 (106·1 to 606·6)	344·5 (133·4 to 748·2)	25·0 (19·7 to 30·1)*	4·0 (1·6 to 8·9)	4·5 (1·7 to 9·8)	11·7 (7·2 to 16·2)*
Endometriosis	894·2 (580·2 to 1240·9)	999·0 (649·1 to 1390·3)	11·7 (10·4 to 12·9)*	13·4 (8·7 to 18·6)	13·0 (8·5 to 18·2)	−2·4 (−3·4 to −1·5)*
Genital prolapse	449·1 (228·1 to 794·4)	519·3 (258·8 to 921·5)	15·6 (11·7 to 18·4)*	8·0 (4·1 to 14·0)	7·3 (3·6 to 12·9)	−8·4 (−11·8 to −5·9)*
Premenstrual syndrome	3287·8 (2048·5 to 4917·5)	3621·6 (2248·2 to 5435·6)	10·2 (8·0 to 12·0)*	48·3 (30·1 to 72·2)	47·3 (29·4 to 71·0)	−2·0 (−3·9 to −0·4)*
Other gynaecological diseases	1659·3 (1213·1 to 2208·2)	1758·0 (1278·9 to 2342·6)	6·0 (4·0 to 8·1)*	24·6 (18·0 to 32·6)	23·0 (16·8 to 30·6)	−6·3 (−8·1 to −4·5)*
Haemoglobinopathies and haemolytic anaemias	20 211·2 (16 303·9 to 25 551·6)	20 604·4 (16 002·3 to 27 392·4)	1·9 (−11·4 to 19·6)	301·0 (243·6 to 378·6)	279·3 (217·4 to 370·5)	−7·2 (−18·9 to 8·7)
Thalassaemias	1366·6 (1131·0 to 1683·8)	1034·6 (839·9 to 1272·9)	−24·3 (−39·0 to −2·4)*	19·8 (16·4 to 24·3)	14·0 (11·4 to 17·2)	−29·0 (−42·6 to −9·0)*
Thalassaemias trait	3696·4 (2473·4 to 5333·5)	3922·2 (2605·5 to 5657·2)	6·1 (4·8 to 7·4)*	55·2 (36·9 to 79·6)	53·2 (35·3 to 76·7)	−3·6 (−4·7 to −2·6)*
Sickle cell disorders	8662·7 (6150·3 to 13061·9)	8973·8 (5936·8 to 14752·8)	3·6 (−23·4 to 40·6)	124·4 (88·4 to 187·0)	120·3 (79·7 to 197·7)	−3·3 (−28·4 to 31·4)
Sickle cell trait	1552·9 (1049·6 to 2211·1)	1720·3 (1153·9 to 2463·9)	10·8 (7·3 to 13·4)*	23·0 (15·5 to 32·7)	23·3 (15·6 to 33·4)	1·4 (−1·9 to 3·6)
G6PD deficiency	1284·4 (1105·7 to 1525·4)	1440·5 (1225·4 to 1706·3)	12·1 (5·3 to 21·5)*	19·8 (17·0 to 23·4)	19·3 (16·4 to 22·9)	−2·4 (−8·4 to 5·3)
G6PD trait	26·9 (18·4 to 37·1)	28·0 (19·2 to 38·9)	4·3 (0·1 to 8·8)*	0·4 (0·3 to 0·6)	0·4 (0·3 to 0·5)	−5·3 (−9·0 to −1·2)*
Other haemoglobinopathies and haemolytic anaemias	3621·4 (2874·6 to 4634·1)	3485·1 (2770·9 to 4426·5)	−3·8 (−6·2 to −1·0)*	58·5 (47·2 to 73·7)	48·8 (39·1 to 61·7)	−16·5 (−19·2 to −13·8)*
Endocrine, metabolic, blood, and immune disorders	5829·0 (5157·9 to 6691·1)	6535·7 (5812·5 to 7435·2)	12·1 (7·6 to 17·0)*	92·6 (82·5 to 105·6)	90·7 (80·9 to 103·0)	−2·1 (−5·8 to 1·7)
Musculoskeletal disorders	**123 801·0 (90 494·0 to 163 616·5)**	**148 986·5 (108 880·7 to 197 118·2)**	**20·3 (19·4 to 21·3)***	**2082·9 (1530·5 to 2750·7)**	**2065·1 (1510·9 to 2730·7)**	**−0·9 (−1·5 to −0·2)***
Rheumatoid arthritis	5204·7 (3777·3 to 6833·5)	6333·4 (4574·6 to 8332·9)	21·7 (18·7 to 24·7)*	90·9 (66·3 to 118·9)	89·7 (65·0 to 117·6)	−1·3 (−3·6 to 1·2)
Osteoarthritis	9562·5 (6666·3 to 13 106·3)	12 886·2 (8 990·3 to 17 634·2)	34·8 (33·6 to 36·0)*	180·4 (125·9 to 247·2)	187·4 (130·8 to 256·4)	3·9 (3·0 to 4·8)*
Low back and neck pain	80 053·5 (57 147·1 to 108 282·6)	94 941·5 (67 745·5 to 128 118·6)	18·6 (17·6 to 19·6)*	1337·3 (958·3 to 1802·5)	1309·7 (936·1 to 1765·1)	−2·1 (−2·7 to −1·4)*
Low back pain	51 243·0 (36 375·0 to 70 714·6)	60 074·8 (42 682·1 to 82 419·2)	17·2 (16·4 to 18·1)*	852·0 (605·3 to 1176·4)	829·5 (589·2 to 1138·3)	−2·6 (−3·2 to −2·0)*
Neck pain	28 810·5 (19 224·7 to 39 466·1)	34 866·7 (23 343·7 to 47 754·3)	21·0 (18·9 to 23·2)*	485·3 (327·2 to 662·1)	480·2 (322·0 to 653·6)	−1·1 (−2·3 to 0·1)
Gout	1063·1 (719·2 to 1451·4)	1342·8 (908·5 to 1843·8)	26·3 (24·6 to 28·0)*	18·9 (12·9 to 25·8)	19·0 (12·9 to 26·1)	0·6 (−0·3 to 1·5)
Other musculoskeletal disorders	27 917·2 (19 404·3 to 38 408·8)	33 482·6 (23 135·4 to 45 865·5)	19·9 (16·7 to 23·0)*	455·4 (316·9 to 623·9)	459·2 (318·0 to 630·7)	0·8 (−1·5 to 3·2)
Other non-communicable diseases	**170 032·0 (132 096·5 to 221 007·5)**	**192 712·9 (148 719·0 to 251 205·4)**	**13·3 (7·1 to 16·9)***	**2726·4 (2098·4 to 3558·8)**	**2687·2 (2068·1 to 3508·3)**	**−1·4 (−6·1 to 1·4)**
Congenital anomalies	57 594·6 (49 489·5 to 69 397·4)	58 355·3 (52 597·9 to 64 983·3)	1·3 (−12·2 to 11·2)	826·5 (711·2 to 994·5)	781·1 (704·2 to 869·9)	−5·5 (−17·9 to 3·5)
Neural tube defects	6925·7 (5218·4 to 9487·8)	5981·2 (4589·5 to 7574·7)	−13·6 (−32·7 to 5·7)	98·3 (74·1 to 134·8)	79·9 (61·3 to 101·2)	−18·8 (−36·7 to −0·6)*
Congenital heart anomalies	26 778·2 (22 186·7 to 31 821·1)	25 706·4 (22 612·9 to 28 639·2)	−4·0 (−18·1 to 7·6)	382·7 (316·9 to 454·7)	343·9 (302·5 to 383·1)	−10·2 (−23·3 to 0·4)

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Cleft lip and cleft palate	355·3 (288·5 to 424·1)	196·0 (150·8 to 259·3)	−44·8 (−54·9 to −33·7)*	5·1 (4·1 to 6·1)	2·6 (2·0 to 3·5)	−48·3 (−57·6 to −38·1)*
Down's syndrome	2379·1 (1571·3 to 3712·7)	2 401·1 (1739·7 to 3 291·8)	0·9 (−23·2 to 29·4)	34·8 (23·1 to 53·9)	32·2 (23·3 to 44·0)	−7·5 (−29·2 to 17·8)
Turner's syndrome	6·0 (2·1 to 12·9)	6·6 (2·4 to 14·4)	11·4 (8·7 to 14·0)*	0·1 (0·0 to 0·2)	0·1 (0·0 to 0·2)	−0·1 (−2·4 to 2·3)
Klinefelter's syndrome	1·2 (0·4 to 2·8)	1·3 (0·5 to 3·2)	13·5 (10·6 to 15·6)*	0·0 (0·0 to 0·0)	0·0 (0·0 to 0·0)	0·2 (−2·2 to 2·0)
Other chromosomal abnormalities	2110·0 (1124·3 to 4575·8)	2354·5 (1418·6 to 3905·9)	11·6 (−19·2 to 35·1)	30·4 (16·4 to 65·4)	31·5 (19·0 to 52·2)	3·6 (−24·3 to 25·0)
Other congenital anomalies	19 039·2 (16 026·4 to 23 290·1)	21 708·1 (18 750·6 to 25 714·7)	14·0 (0·3 to 26·3)*	275·0 (231·4 to 336·5)	291·0 (251·2 to 344·6)	5·8 (−6·6 to 16·7)
Skin and subcutaneous diseases	42 069·1 (27 826·1 to 62 299·6)	47 222·7 (31 372·1 to 69 571·8)	12·3 (11·5 to 13·2)*	639·6 (426·1 to 942·5)	643·4 (428·2 to 946·7)	0·6 (0·1 to 1·2)*
Dermatitis	7733·8 (5244·5 to 10760·5)	8788·0 (5957·2 to 12275·5)	13·6 (12·9 to 14·4)*	117·8 (80·2 to 164·1)	119·7 (81·3 to 166·6)	1·6 (1·0 to 2·2)*
Psoriasis	5478·8 (3816·1 to 7443·3)	6438·3 (4487·4 to 8755·9)	17·5 (16·6 to 18·4)*	87·4 (60·9 to 118·7)	87·9 (61·3 to 119·5)	0·6 (0·0 to 1·2)
Cellulitis	406·1 (251·0 to 550·4)	498·2 (315·1 to 692·8)	22·7 (11·9 to 34·6)*	6·9 (4·3 to 9·4)	7·0 (4·5 to 9·8)	1·6 (−7·4 to 11·6)
Pyoderma	1070·5 (714·3 to 1585·5)	1361·7 (932·3 to 2020·6)	27·2 (17·0 to 38·8)*	17·5 (11·7 to 25·6)	19·1 (13·1 to 28·2)	9·2 (0·6 to 18·9)*
Scabies	4944·3 (2786·4 to 8050·4)	5268·9 (2947·0 to 8616·4)	6·6 (3·8 to 9·5)*	73·0 (41·2 to 118·8)	71·1 (39·8 to 116·0)	−2·5 (−4·5 to −0·5)*
Fungal skin diseases	2457·6 (976·3 to 5214·9)	2783·3 (1101·3 to 5914·6)	13·3 (12·4 to 14·1)*	37·2 (14·7 to 79·0)	37·8 (15·0 to 80·3)	1·7 (1·4 to 2·0)*
Viral skin diseases	4977·3 (3147·1 to 7362·6)	5396·9 (3412·0 to 7962·7)	8·4 (7·9 to 9·0)*	73·7 (46·7 to 109·3)	73·0 (46·2 to 107·9)	−1·0 (−1·4 to −0·6)*
Acne vulgaris	6553·4 (3137·7 to 12159·0)	6854·0 (3271·3 to 12744·4)	4·6 (3·5 to 5·7)*	91·1 (43·7 to 169·0)	91·9 (43·9 to 171·0)	0·8 (−0·1 to 1·8)
Alopecia areata	610·5 (376·1 to 911·7)	695·6 (427·5 to 1035·9)	13·9 (13·1 to 14·7)*	9·4 (5·8 to 14·0)	9·3 (5·7 to 13·8)	−1·0 (−1·7 to −0·4)*
Pruritus	631·4 (306·3 to 1152·1)	741·6 (359·8 to 1349·6)	17·5 (15·5 to 19·4)*	10·1 (4·9 to 18·5)	10·2 (4·9 to 18·6)	0·5 (−0·7 to 1·7)
Urticaria	3718·5 (2297·3 to 5286·3)	4115·7 (2560·6 to 5836·2)	10·7 (9·5 to 12·0)*	55·5 (34·5 to 78·7)	55·5 (34·6 to 78·7)	0·0 (−0·5 to 0·4)
Decubitus ulcer	494·1 (328·7 to 602·5)	609·1 (415·1 to 738·7)	23·3 (17·3 to 33·2)*	9·8 (6·5 to 11·9)	9·4 (6·4 to 11·3)	−4·3 (−8·9 to 3·7)*
Other skin and subcutaneous diseases	2992·7 (1486·8 to 5413·5)	3671·3 (1817·7 to 6638·7)	22·7 (21·9 to 23·5)*	50·2 (24·9 to 90·8)	51·5 (25·5 to 93·2)	2·6 (2·1 to 3·3)*
Sense organ diseases	54 708·4 (38 076·6 to 75 346·3)	68 515·2 (47 752·5 to 94 246·6)	25·2 (24·2 to 26·4)*	993·6 (694·9 to 1 361·8)	999·9 (697·1 to 1 370·3)	0·6 (−0·1 to 1·3)
Glaucoma	388·4 (268·1 to 538·9)	541·3 (369·5 to 748·0)	39·4 (37·0 to 41·9)*	8·0 (5·5 to 11·2)	8·4 (5·7 to 11·6)	4·3 (2·6 to 5·8)*
Cataract	3091·3 (2213·8 to 4152·6)	3879·7 (2766·1 to 5232·4)	25·5 (24·1 to 26·9)*	62·9 (45·1 to 84·3)	60·3 (43·0 to 81·0)	−4·2 (−5·2 to −3·2)*
Macular degeneration	313·2 (219·5 to 429·6)	462·4 (327·4 to 633·5)	47·7 (45·2 to 49·9)*	6·9 (4·9 to 9·5)	7·4 (5·2 to 10·1)	6·9 (5·3 to 8·6)*
Refraction and accommodation disorders	12 046·9 (7737·6 to 18 905·4)	14 593·8 (9388·5 to 22 942·4)	21·1 (20·2 to 22·1)*	207·8 (133·9 to 326·0)	207·3 (133·7 to 324·8)	−0·3 (−0·9 to 0·4)
Age-related and other hearing loss	32 119·0 (21 992·4 to 44 438·1)	40 596·8 (27 842·2 to 56 168·9)	26·4 (24·6 to 28·3)*	589·4 (405·6 to 817·1)	595·9 (409·6 to 825·0)	1·1 (0·0 to 2·1)
Other vision loss	1352·0 (957·1 to 1852·2)	1756·4 (1247·4 to 2393·6)	29·9 (27·8 to 32·1)*	23·9 (17·0 to 32·5)	25·2 (17·9 to 34·1)	5·6 (4·3 to 6·7)*
Other sense organ diseases	5397·7 (3358·7 to 7841·8)	6684·7 (4178·4 to 9722·8)	23·8 (22·9 to 24·8)*	94·7 (59·3 to 137·2)	95·5 (59·9 to 138·6)	0·9 (0·2 to 1·5)*

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Oral disorders	13 868·2 (8387·2 to 21 285·6)	16 969·6 (10 280·0 to 26 059·7)	22·4 (21·6 to 23·2)*	241·3 (147·2 to 367·9)	240·8 (146·9 to 367·8)	−0·2 (−0·5 to 0·1)
Deciduous caries	141·4 (61·3 to 279·6)	147·2 (62·8 to 292·3)	4·1 (1·6 to 5·9)*	2·1 (0·9 to 4·1)	2·0 (0·9 to 4·0)	−2·7 (−4·9 to −0·8)*
Permanent caries	1536·3 (681·5 to 2960·1)	1743·4 (773·5 to 3358·0)	13·5 (12·6 to 14·4)*	23·7 (10·5 to 45·7)	23·6 (10·5 to 45·5)	−0·4 (−1·2 to 0·4)
Periodontal diseases	2808·4 (1084·9 to 5841·7)	3520·7 (1357·6 to 7337·3)	25·4 (24·1 to 26·5)*	48·0 (18·6 to 100·0)	48·6 (18·8 to 101·2)	1·2 (0·6 to 1·8)*
Edentulism and severe tooth loss	5999·5 (4012·3 to 8293·2)	7640·3 (5092·8 to 10572·8)	27·3 (26·9 to 27·7)*	114·6 (76·7 to 158·5)	113·6 (76·0 to 157·3)	−0·8 (−1·1 to −0·6)*
Other oral disorders	3382·7 (2093·2 to 5085·7)	3918·1 (2423·4 to 5894·1)	15·8 (15·3 to 16·4)*	53·0 (32·8 to 79·5)	53·0 (32·8 to 79·6)	0·0 (−0·2 to 0·3)
Sudden infant death syndrome	1791·7 (1458·5 to 2904·4)	1650·1 (1366·4 to 2367·7)	−7·9 (−23·0 to 8·9)	25·5 (20·7 to 41·3)	22·0 (18·2 to 31·6)	−13·5 (−27·7 to 2·3)
Injuries	**263 084·3 (245 566·5 to 278 621·5)**	**249 791·3 (231 409·2 to 266 419·2)**	**−5·1 (−8·5 to −0·9)***	**4044·0 (3764·8 to 4300·1)**	**3376·1 (3120·8 to 3607·0)**	**−16·5 (−19·4 to −13·0)***
Transport injuries	**77 146·4 (73 768·7 to 80 734·9)**	**72 365·5 (68 372·4 to 76 237·9)**	**−6·2 (−11·1 to −1·8)***	**1175·5 (1121·9 to 1231·3)**	**971·4 (917·0 to 1024·0)**	**−17·4 (−21·6 to −13·5)***
Road injuries	71 941·1 (68 596·1 to 75 312·5)	67 270·4 (63 538·6 to 70 859·9)	−6·5 (−11·4 to −2·2)*	1095·3 (1042·8 to 1145·8)	903·0 (854·0 to 951·5)	−17·6 (−21·8 to −13·8)*
Pedestrian road injuries	27 185·9 (25 567·5 to 29 487·1)	24 491·1 (22 747·9 to 26 770·6)	−9·9 (−16·4 to −3·8)*	417·2 (392·7 to 452·1)	330·1 (307·3 to 360·7)	−20·9 (−26·5 to −15·5)*
Cyclist road injuries	3721·2 (3357·8 to 4119·6)	3399·8 (3022·9 to 3807·0)	−8·6 (−15·1 to −2·1)*	58·5 (52·7 to 65·1)	46·3 (41·1 to 52·0)	−20·9 (−26·3 to −15·4)*
Motorcyclist road injuries	13 655·4 (12 181·3 to 14 651·4)	13 686·2 (12 440·3 to 15 369·7)	0·2 (−7·8 to 10·6)	204·9 (182·3 to 219·9)	182·4 (165·7 to 204·3)	−10·9 (−17·9 to −1·7)*
Motor vehicle road injuries	26 257·7 (24 307·0 to 28 943·8)	24 460·3 (22 362·4 to 26 719·4)	−6·8 (−11·6 to −1·8)*	397·6 (368·7 to 437·0)	327·5 (299·3 to 357·3)	−17·6 (−21·8 to −13·2)*
Other road injuries	1120·9 (782·6 to 1331·6)	1233·1 (858·6 to 1446·6)	10·0 (−5·2 to 31·3)	17·1 (12·1 to 20·2)	16·6 (11·6 to 19·4)	−2·9 (−16·0 to 15·4)
Other transport injuries	5205·3 (4772·9 to 5728·4)	5095·1 (4507·0 to 5967·9)	−2·1 (−10·5 to 7·5)	80·2 (73·6 to 88·4)	68·4 (60·6 to 80·2)	−14·7 (−21·8 to −6·7)*
Unintentional injuries	**118 001·9 (105 534·5 to 129 998·5)**	**107 990·9 (95 660·4 to 120 900·3)**	**−8·5 (−11·9 to −3·4)***	**1840·5 (1642·4 to 2033·1)**	**1481·0 (1310·3 to 1660·5)**	**−19·5 (−22·2 to −15·3)***
Falls	23 912·3 (20 767·3 to 27 587·9)	26 101·6 (22 363·6 to 30 779·5)	9·2 (3·6 to 14·6)*	403·3 (349·6 to 467·0)	368·3 (315·1 to 435·0)	−8·7 (−13·1 to −4·4)*
Drowning	24 207·3 (20 715·5 to 25 812·8)	17 864·3 (15 792·7 to 19 306·8)	−26·2 (−30·6 to −20·0)*	356·2 (305·1 to 379·5)	241·1 (213·0 to 260·6)	−32·3 (−36·3 to −26·7)*
Fire, heat, and hot substances	11 737·6 (9 928·4 to 12 948·0)	10 274·1 (8 701·9 to 11 443·4)	−12·5 (−17·4 to −5·1)*	179·7 (153·4 to 198·0)	139·0 (117·7 to 155·0)	−22·6 (−26·8 to −16·6)*
Poisonings	5746·4 (3978·7 to 7215·7)	4866·9 (3240·1 to 6070·3)	−15·3 (−28·9 to 3·6)	86·6 (60·4 to 107·8)	65·5 (43·6 to 81·5)	−24·4 (−36·0 to −7·5)*
Exposure to mechanical forces	13 753·4 (12 020·2 to 15 236·7)	13 118·4 (10 878·2 to 14 847·6)	−4·6 (−11·8 to 1·7)	210·2 (183·6 to 234·3)	177·4 (146·9 to 201·3)	−15·6 (−21·7 to −10·2)*
Unintentional firearm injuries	1655·9 (1188·2 to 1837·5)	1546·4 (1101·5 to 1727·2)	−6·6 (−11·9 to −0·6)*	24·9 (18·0 to 27·6)	20·7 (14·8 to 23·1)	−16·8 (−21·4 to −11·8)*
Unintentional suffocation	2647·9 (2075·2 to 3023·5)	2495·6 (1885·3 to 2883·4)	−5·8 (−17·6 to 7·8)	39·3 (30·8 to 44·8)	33·9 (25·7 to 39·1)	−13·7 (−24·3 to −1·8)*
Other exposure to mechanical forces	9449·6 (8051·7 to 10717·9)	9076·5 (7327·9 to 10524·0)	−3·9 (−11·4 to 3·1)	146·0 (124·4 to 166·3)	122·8 (99·1 to 142·7)	−15·9 (−22·2 to −10·1)*
Adverse effects of medical treatment	5671·1 (4245·4 to 6758·2)	5384·9 (4213·4 to 6360·5)	−5·0 (−10·5 to 2·7)	89·8 (67·8 to 106·9)	74·1 (58·2 to 87·7)	−17·4 (−21·6 to −11·7)*
Animal contact	6453·3 (4501·0 to 7223·6)	5661·2 (3760·0 to 7514·8)	−12·3 (−19·9 to 10·9)	97·6 (68·4 to 109·2)	76·6 (50·8 to 101·5)	−21·5 (−28·2 to −0·7)*
Venomous animal contact	5306·6 (3504·8 to 5989·8)	4648·0 (2901·8 to 6463·8)	−12·4 (−20·6 to 12·9)	80·1 (53·1 to 90·4)	62·8 (39·2 to 87·3)	−21·6 (−29·0 to 1·1)

(Table 1 continues on next page)

	All-age DALYs (thousands)			Age-standardised rate (per 100 000)		
	2005	2015	Percentage change, 2005–15	2005	2015	Percentage change, 2005–15
(Continued from previous page)						
Non-venomous animal contact	1146·7 (920·0 to 1358·6)	1013·2 (840·1 to 1180·4)	−11·6 (−20·1 to 5·0)	17·5 (14·1 to 20·6)	13·8 (11·4 to 16·1)	−21·2 (−28·5 to −6·9)*
Foreign body	8668·4 (6684·4 to 10942·0)	8244·8 (6786·9 to 9635·2)	−4·9 (−14·1 to 4·8)	132·2 (103·4 to 165·2)	112·4 (92·8 to 131·1)	−15·0 (−22·5 to −7·3)*
Pulmonary aspiration and foreign body in airway	6632·4 (4907·7 to 8950·1)	6321·8 (5088·3 to 7704·2)	−4·7 (−15·7 to 6·1)	101·0 (76·1 to 134·5)	86·2 (69·6 to 104·7)	−14·7 (−23·9 to −6·2)*
Foreign body in eyes	48·8 (20·8 to 87·9)	56·2 (24·0 to 101·1)	15·2 (13·8 to 16·7)*	0·8 (0·3 to 1·4)	0·8 (0·3 to 1·4)	0·5 (−0·9 to 1·3)
Foreign body in other body part	1987·3 (1331·1 to 2717·2)	1866·9 (1394·9 to 2247·3)	−6·1 (−19·8 to 6·4)	30·4 (20·8 to 41·4)	25·4 (19·1 to 30·6)	−16·4 (−28·8 to −6·5)*
Environmental heat and cold exposure	4503·5 (3641·3 to 5457·2)	4234·7 (3350·6 to 5294·9)	−6·0 (−10·1 to −1·4)*	74·1 (59·9 to 89·9)	58·7 (46·4 to 73·6)	−20·7 (−24·0 to −17·1)*
Other unintentional injuries	13 348·6 (11 406·7 to 15 619·1)	12 240·0 (10 234·9 to 14 692·0)	−8·3 (−12·9 to −3·8)*	210·9 (178·2 to 249·5)	167·9 (139·9 to 202·4)	−20·4 (−24·1 to −16·6)*
Self-harm and interpersonal violence	**58 615·7 (52 794·8 to 60 379·5)**	**55 719·4 (50 909·8 to 58 127·7)**	**−4·9 (−9·0 to −0·8)***	**889·6 (801·0 to 916·0)**	**741·1 (676·7 to 773·2)**	**−16·7 (−20·3 to −13·0)***
Self-harm	35 819·1 (31 467·1 to 37 112·4)	34 260·9 (30 852·1 to 36 042·4)	−4·4 (−10·4 to 1·6)	551·9 (484·7 to 571·2)	457·9 (412·2 to 481·5)	−17·0 (−22·3 to −11·9)*
Interpersonal violence	22 796·5 (20 747·8 to 23 566·7)	21 458·5 (19 354·8 to 22 540·1)	−5·9 (−9·0 to −2·0)*	337·6 (308·1 to 349·1)	283·3 (255·6 to 297·4)	−16·1 (−18·8 to −12·7)*
Assault by firearm	8856·3 (7747·9 to 9172·1)	9188·1 (7854·5 to 9689·2)	3·7 (0·0 to 8·2)	129·0 (113·0 to 133·6)	120·7 (103·2 to 127·3)	−6·4 (−9·9 to −2·4)*
Assault by sharp object	5425·2 (5050·4 to 5731·6)	4546·1 (4223·1 to 4937·8)	−16·2 (−20·6 to −11·2)*	80·5 (75·1 to 85·0)	59·9 (55·6 to 65·0)	−25·6 (−29·6 to −21·2)*
Assault by other means	8515·1 (7723·3 to 9065·4)	7724·3 (6927·0 to 8395·8)	−9·3 (−14·2 to −2·7)*	128·2 (116·6 to 136·2)	102·7 (92·2 to 111·6)	−19·8 (−24·2 to −14·1)*
Forces of nature, war, and legal intervention	**9320·3 (6951·1 to 11 778·4)**	**13 715·5 (8561·9 to 18 537·5)**	**47·2 (−1·9 to 100·5)**	**138·4 (103·8 to 174·8)**	**182·6 (114·4 to 246·3)**	**31·9 (−11·6 to 79·5)**
Exposure to forces of nature	6203·9 (4037·7 to 8412·0)	1435·5 (1092·6 to 1846·4)	−76·9 (−81·2 to −69·4)*	91·9 (60·2 to 124·2)	19·6 (14·9 to 25·2)	−78·7 (−82·7 to −72·0)*
Collective violence and legal intervention	3116·4 (2504·2 to 3760·8)	12 279·9 (7208·0 to 17 075·2)	294·0 (175·8 to 394·3)*	46·5 (37·4 to 56·1)	163·0 (95·9 to 226·4)	250·5 (144·1 to 341·2)*

Data in parentheses are 95% uncertainty intervals. DALYs=disability-adjusted life-years. G6PD=glucose-6-phosphate dehydrogenase. *Percentage changes that are statistically significant.

Table 1: **Global all-age DALYs and age-standardised DALY rates in 2005 and 2015 with median percentage change between 2005 and 2015 for all causes**

with each recording large increases in burden from 1990 to 2005, but by 2015, all measures of DALYs and relative ranks for malaria and HIV/AIDS had fallen markedly. Trends for NCDs and injuries, both in terms of ranks and changes in disease burden, were more varied. Between 1990 and 2005, total DALYs and all-age DALY rates significantly increased for many NCDs, including ischaemic heart disease, low back and neck pain, lung cancer, chronic kidney disease, and migraine. For these NCDs, their relative ranks also climbed by 2005, yet their age-standardised DALY rates either significantly decreased or remained relatively unchanged, reflecting the effects of changes in population age structure. This pattern continued through 2015 for many NCDs, and was further exemplified by Alzheimer's disease and other dementias as it rose to the 29th leading cause of global DALYs amid a significant decrease in age-standardised DALY rates. From 1990 to 2005, all three measures of DALYs significantly increased for a subset of NCDs (ie, sense organ diseases, diabetes, depressive disorders, and other musculoskeletal disorders), which contributed to their rises in relative ranking. More heterogeneous patterns emerged for injuries; for instance, road injuries and interpersonal violence each rose in reflective ranks from 2005 to 2015, despite significant reductions in total DALYs, all-age DALY rates, and age-standardised DALY rates from each cause.

For at least one of their leading causes of DALYs in 2015, most age groups under 40 years old had a more than 31% decrease in total burden (figure 3). The causes for which DALYs largely declined included lower respiratory infections, diarrhoeal diseases, malaria, preterm birth complications, and drowning among children younger than 5 years, and HIV/AIDS and malaria for people between the ages of 5 years and 40 years. Increases in cause-specific DALYs varied more by age, with rising DALYs due to depressive disorders and drug use disorders for populations at age 20–30 years. DALYs from low back and neck pain increased since 2005 for many age groups.

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
Global	70·73 (70·48–70·96)	61·37 (58·61–63·76)	65·69 (65.45–65·93)	57·96 (55·69–59·98)	74·83 (74·39–75·25)	64·88 (61·96–67·46)	69·04 (68·63–69·42)	60·91 (58·55–63·01)	18·46 (18·31–18·61)	14·19 (12·98–15·28)	15·45 (15·31–15·59)	11·90 (10·89–12·81)
High SDI	80·26 (80·23–80·28)	69·62 (66·53–72·30)	73·25 (73·20–73·29)	64·82 (62·36–66·96)	82·34 (82·26–82·41)	71·33 (68·13–74·13)	76·21 (76·10–76·31)	67·27 (64·70–69·54)	20·96 (20·92–21·01)	16·18 (14·83–17·38)	17·66 (17·62–17·70)	13·55 (12·38–14·58)
High-middle SDI	75·26 (75·02–75·51)	65·85 (63·11–68·23)	69·26 (68·96–69·53)	61·50 (59·22–63·59)	79·13 (78·80–79·43)	69·09 (66·18–71·63)	72·69 (72·25–73·10)	64·46 (62·01–66·60)	19·20 (19·01–19·40)	14·90 (13·69–16·00)	15·81 (15·58–16·01)	12·30 (11·29–13·21)
Middle SDI	71·83 (71·49–72·19)	62·72 (60·08–65·04)	66·80 (66·43–67·19)	59·31 (57·11–61·26)	75·71 (75·21–76·19)	66·02 (63·24–68·52)	69·55 (68·99–70·14)	61·74 (59·46–63·75)	17·33 (17·03–17·62)	13·36 (12·19–14·40)	14·30 (14·01–14·59)	11·13 (10·24–11·95)
Low-middle SDI	62·59 (61·97–63·21)	53·65 (51·01–56·01)	60·30 (59·69–60·86)	52·55 (50·22–54·66)	67·72 (66·80–68·61)	58·18 (55·33–60·84)	63·83 (62·99–64·62)	55·85 (53·44–58·01)	14·75 (14·34–15·16)	11·00 (9·95–12·05)	13·39 (13·06–13·70)	10·09 (9·18–10·94)
Low SDI	56·19 (55·16–57·24)	48·18 (45·46–50·55)	54·49 (53·52–55·45)	47·34 (45·02–49·45)	62·30 (60·22–64·27)	53·64 (50·41–56·49)	59·13 (56·85–61·28)	51·66 (48·91–54·31)	13·35 (12·36–14·29)	9·88 (8·61–11·06)	12·78 (11·77–13·68)	9·55 (8·41–10·63)
High-income	82·09 (82·07–82·11)	71·13 (67·95–73·87)	76·35 (76·33–76·37)	67·48 (64·90–69·75)	83·42 (83·38–83·46)	72·21 (68·97–75·02)	78·10 (78·05–78·15)	68·91 (66·27–71·25)	21·68 (21·65–21·70)	16·78 (15·39–18·00)	18·24 (18·22–18·27)	14·03 (12·82–15·09)
High-income North America	80·43 (80·39–80·47)	68·84 (65·64–71·64)	75·33 (75·28–75·37)	65·86 (63·17–68·24)	81·75 (81·68–81·82)	69·80 (66·51–72·75)	77·02 (76·95–77·10)	67·11 (64·32–69·65)	20·80 (20·74–20·86)	15·56 (14·12–16·84)	18·17 (18·12–18·21)	13·50 (12·21–14·67)
Canada	82·53 (82·48–82·60)	71·39 (68·19–74·21)	77·81 (77·75–77·86)	68·29 (65·47–70·74)	83·86 (83·66–84·08)	72·49 (69·32–75·37)	79·50 (79·28–79·72)	69·64 (66·80–72·16)	21·87 (21·72–22·02)	16·77 (15·33–18·04)	18·81 (18·68–18·94)	14·29 (13·00–15·44)
Greenland	71·07 (70·24–71·91)	61·63 (59·00–64·06)	67·44 (66·72–68·12)	59·74 (57·50–61·80)	74·90 (73·77–75·71)	64·81 (61·93–67·47)	70·00 (69·06–70·94)	61·90 (59·46–64·13)	16·76 (16·23–17·09)	12·65 (11·46–13·71)	14·26 (14·01–14·52)	10·79 (9·82–11·66)
USA	80·21 (80·17–80·25)	68·57 (65·38–71·38)	75·06 (75·00–75·11)	65·60 (62·93–67·96)	81·52 (81·44–81·60)	69·50 (66·21–72·47)	76·74 (76·66–76·83)	66·82 (64·05–69·35)	20·68 (20·62–20·74)	15·42 (13·99–16·71)	18·09 (18·04–18·14)	13·41 (12·12–14·58)
Australasia	83·25 (83·20–83·31)	71·66 (68·37–74·50)	78·57 (78·52–78·62)	68·83 (66·11–71·26)	84·32 (84·21–84·44)	72·57 (69·31–75·54)	80·09 (79·98–80·20)	70·08 (67·24–72·60)	22·01 (21·93–22·09)	17·06 (15·65–18·29)	19·11 (19·05–19·18)	14·66 (13·42–15·79)
Australia	83·55 (83·49–83·61)	71·88 (68·59–74·74)	78·76 (78·70–78·82)	68·94 (66·19–71·38)	84·52 (84·41–84·65)	72·72 (69·43–75·71)	80·19 (80·08–80·31)	70·12 (67·25–72·66)	22·13 (22·04–22·22)	17·15 (15·75–18·40)	19·16 (19·08–19·23)	14·67 (13·43–15·82)
New Zealand	81·80 (81·67–81·93)	70·59 (67·45–73·42)	77·61 (77·48–77·73)	68·32 (65·64–70·68)	83·29 (83·03–83·53)	71·83 (68·60–74·82)	79·58 (79·30–79·88)	69·94 (67·20–72·40)	21·39 (21·20–21·55)	16·57 (15·20–17·82)	18·89 (18·74–19·06)	14·59 (13·37–15·68)
High-income Asia Pacific	84·71 (84·67–84·76)	74·76 (71·79–77·29)	77·77 (77·70–77·83)	69·68 (67·35–71·75)	85·95 (85·85–86·05)	75·82 (72·83–78·39)	79·39 (79·24–79·53)	71·05 (68·64–73·16)	23·39 (23·32–23·46)	18·66 (17·29–19·85)	18·67 (18·61–18·73)	14·63 (13·48–15·62)
Brunei	78·95 (78·49–79·31)	69·48 (66·76–72·02)	74·80 (74·36–75·15)	66·88 (64·59–69·00)	79·36 (78·84–79·87)	69·96 (67·21–72·39)	75·13 (74·43–75·87)	67·20 (64·83–69·39)	18·77 (18·50–19·01)	14·81 (13·69–15·83)	15·96 (15·61–16·33)	12·45 (11·43–13·43)
Japan	85·34 (85·31–85·37)	75·43 (72·48–77·97)	78·46 (78·44–78·49)	70·32 (67·99–72·38)	86·35 (86·28–86·41)	76·28 (73·33–78·85)	79·94 (79·88–80·00)	71·54 (69·14–73·67)	23·78 (23·73–23·84)	19·04 (17·65–20·25)	18·94 (18·91–18·98)	14·85 (13·69–15·88)
Singapore	82·17 (81·99–82·35)	73·34 (70·67–75·64)	77·88 (77·70–78·05)	70·62 (68·52–72·48)	83·99 (83·69–84·35)	75·02 (72·28–77·44)	79·83 (79·45–80·18)	72·31 (70·06–74·21)	21·19 (20·97–21·46)	17·24 (16·02–18·32)	18·19 (17·94–18·42)	14·75 (13·69–15·65)
South Korea	81·97 (81·79–82·15)	71·92 (68·98–74·42)	75·22 (74·95–75·50)	67·35 (65·02–69·41)	84·28 (83·91–84·64)	73·97 (70·91–76·61)	77·53 (76·98–78·05)	69·38 (66·95–71·51)	21·66 (21·39–21·91)	16·97 (15·58–18·18)	17·33 (17·02–17·62)	13·49 (12·34–14·50)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Western Europe	82·60 (82·59–82·62)	71·55 (68·33–74·39)	76·99 (76·98–77·01)	68·13 (65·50–70·42)	83·97 (83·91–84·03)	72·75 (69·44–75·62)	78·93 (78·87–79·00)	69·82 (67·16–72·15)	21·64 (21·60–21·67)	16·79 (15·38–18·01)	18·29 (18·25–18·32)	14·20 (12·99–15·23)
Andorra	87·91 (87·62–88·21)	75·88 (72·38–78·96)	80·38 (79·98–80·77)	70·89 (68·11–73·38)	88·44 (88·12–88·73)	76·30 (72·75–79·42)	81·20 (80·80–81·57)	71·57 (68·74–74·03)	24·99 (24·73–25·23)	19·38 (17·77–20·82)	19·53 (19·32–19·74)	15·16 (13·88–16·31)
Austria	82·22 (82·15–82·30)	71·19 (67·98–74·02)	76·63 (76·55–76·71)	67·65 (65·05–69·96)	83·66 (83·52–83·79)	72·42 (69·15–75·31)	78·81 (78·66–78·95)	69·59 (66·86–71·97)	21·34 (21·25–21·43)	16·56 (15·16–17·79)	18·21 (18·13–18·29)	14·12 (12·93–15·18)
Belgium	81·97 (81·87–82·07)	70·88 (67·69–73·65)	76·18 (76·08–76·29)	67·18 (64·52–69·46)	83·19 (82·82–83·56)	71·96 (68·66–74·88)	77·83 (77·37–78·27)	68·62 (65·99–71·05)	21·22 (20·97–21·49)	16·29 (14·84–17·59)	17·62 (17·36–17·88)	13·47 (12·27–14·58)
Cyprus	82·15 (81·97–82·33)	71·02 (67·78–73·89)	75·90 (75·73–76·07)	67·09 (64·50–69·34)	85·05 (84·80–85·29)	73·41 (69·97–76·38)	78·69 (78·38–78·99)	69·38 (66·65–71·82)	22·49 (22·31–22·66)	17·33 (15·81–18·67)	17·95 (17·77–18·13)	13·78 (12·58–14·90)
Denmark	80·50 (80·39–80·62)	69·73 (66·63–72·49)	76·08 (75·98–76·19)	67·24 (64·67–69·51)	82·44 (82·15–82·72)	71·39 (68·26–74·21)	78·31 (78·03–78·60)	69·21 (66·59–71·56)	20·43 (20·24–20·62)	15·83 (14·49–17·01)	17·64 (17·47–17·80)	13·74 (12·63–14·71)
Finland	82·43 (82·30–82·55)	71·05 (67·72–74·00)	75·55 (75·41–75·68)	66·44 (63·69–68·82)	83·87 (83·60–84·15)	72·37 (68·92–75·31)	77·97 (77·62–78·32)	68·59 (65·86–70·98)	21·57 (21·39–21·76)	16·59 (15·12–17·84)	17·97 (17·79–18·16)	13·83 (12·60–14·90)
France	83·90 (83·87–83·94)	72·66 (69·29–75·57)	76·81 (76·78–76·84)	68·01 (65·38–70·31)	85·17 (85·01–85·33)	73·83 (70·44–76·73)	78·39 (78·17–78·60)	69·30 (66·55–71·64)	23·00 (22·89–23·11)	17·91 (16·38–19·21)	18·69 (18·58–18·80)	14·32 (12·99–15·43)
Germany	82·06 (82·03–82·10)	70·86 (67·65–73·74)	76·58 (76·54–76·61)	67·72 (65·12–70·01)	83·19 (83·07–83·30)	71·85 (68·59–74·75)	78·36 (78·23–78·49)	69·31 (66·67–71·65)	20·95 (20·88–21·03)	16·23 (14·87–17·40)	17·80 (17·73–17·87)	13·88 (12·74–14·88)
Greece	82·34 (82·25–82·43)	71·62 (68·49–74·37)	76·82 (76·73–76·92)	68·22 (65·71–70·46)	83·49 (83·25–83·74)	72·64 (69·46–75·42)	78·42 (78·10–78·72)	69·60 (67·00–71·88)	20·96 (20·78–21·14)	16·38 (15·01–17·54)	18·30 (18·12–18·47)	14·30 (13·13–15·34)
Iceland	83·64 (83·28–84·06)	72·37 (69·13–75·24)	79·65 (79·44–79·92)	70·50 (67·82–72·89)	85·82 (85·38–86·30)	74·35 (70·99–77·33)	80·93 (80·60–81·25)	71·60 (68·91–73·99)	23·00 (22·63–23·43)	17·83 (16·29–19·21)	19·25 (19·07–19·43)	14·93 (13·69–16·05)
Ireland	81·77 (81·49–82·11)	70·80 (67·53–73·65)	77·65 (77·39–77·86)	68·43 (65·76–70·81)	84·31 (83·60–85·02)	72·94 (69·60–76·00)	79·18 (78·94–79·51)	69·74 (66·95–72·16)	21·98 (21·36–22·66)	17·09 (15·66–18·46)	18·30 (18·08–18·61)	14·14 (12·92–15·20)
Israel	81·73 (81·57–81·87)	70·97 (67·90–73·67)	77·63 (77·46–77·77)	68·60 (65·94–70·92)	83·82 (83·55–84·07)	72·69 (69·47–75·47)	80·18 (79·92–80·47)	70·72 (67·94–73·16)	21·29 (21·09–21·47)	16·44 (15·05–17·64)	19·10 (18·93–19·28)	14·72 (13·43–15·83)
Italy	83·73 (83·69–83·77)	72·34 (69·02–75·27)	78·29 (78·26–78·33)	69·36 (66·72–71·67)	84·57 (84·44–84·71)	73·10 (69·76–76·01)	79·64 (79·48–79·78)	70·58 (67·86–72·95)	21·90 (21·80–21·99)	16·87 (15·44–18·12)	18·37 (18·27–18·45)	14·27 (13·05–15·31)
Luxembourg	82·51 (82·32–82·73)	70·98 (67·62–73·95)	77·24 (77·03–77·44)	67·78 (64·99–70·19)	84·29 (84·01–84·62)	72·47 (69·05–75·42)	79·86 (79·60–80·12)	70·09 (67·20–72·60)	21·79 (21·59–22·05)	16·67 (15·16–17·96)	18·69 (18·54–18·83)	14·31 (13·05–15·45)
Malta	82·73 (82·33–83·10)	71·52 (68·23–74·41)	78·32 (77·92–78·69)	69·06 (66·33–71·43)	84·48 (84·15–84·84)	72·97 (69·61–75·95)	79·65 (79·26–80·06)	70·17 (67·29–72·59)	22·05 (21·80–22·33)	17·03 (15·60–18·34)	18·67 (18·43–18·92)	14·48 (13·25–15·55)
Netherlands	81·63 (81·53–81·73)	70·43 (67·22–73·29)	77·33 (77·24–77·42)	68·31 (65·65–70·67)	83·40 (83·08–83·72)	71·93 (68·64–74·87)	79·17 (78·86–79·52)	69·89 (67·22–72·30)	21·22 (21·02–21·47)	16·28 (14·85–17·52)	17·78 (17·59–18·00)	13·75 (12·58–14·80)
Norway	82·42 (82·27–82·58)	70·96 (67·71–73·85)	77·81 (77·66–77·95)	68·50 (65·80–70·87)	84·08 (83·81–84·34)	72·56 (69·27–75·55)	79·94 (79·68–80·21)	70·40 (67·62–72·90)	21·54 (21·35–21·73)	16·65 (15·28–17·91)	18·57 (18·41–18·74)	14·36 (13·14–15·48)
Portugal	81·74 (81·66–81·83)	70·60 (67·34–73·41)	75·06 (74·96–75·14)	66·36 (63·75–68·59)	83·86 (83·69–84·02)	72·40 (69·05–75·36)	77·65 (77·47–77·83)	68·61 (65·93–70·95)	21·38 (21·26–21·49)	16·48 (15·07–17·73)	17·71 (17·62–17·81)	13·72 (12·59–14·76)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Spain	83·63 (83·59–83·67)	72·81 (69·58–75·61)	76·91 (76·87–76·95)	68·29 (65·70–70·55)	85·27 (85·17–85·38)	74·27 (70·99–77·13)	79·84 (79·72–79·96)	70·91 (68·26–73·23)	22·50 (22·42–22·58)	17·58 (16·12–18·83)	18·86 (18·79–18·92)	14·72 (13·49–15·77)
Sweden	82·61 (82·50–82·73)	71·97 (68·89–74·70)	78·42 (78·30–78·54)	69·24 (66·58–71·58)	83·98 (83·74–84·25)	73·04 (69·93–75·82)	80·25 (80·01–80·48)	70·70 (67·98–73·16)	21·39 (21·22–21·59)	16·59 (15·24–17·78)	18·72 (18·57–18·86)	14·36 (13·13–15·47)
Switzerland	83·72 (83·59–83·85)	72·15 (68·81–75·09)	78·67 (78·54–78·80)	69·23 (66·47–71·66)	85·18 (84·89–85·50)	73·55 (70·15–76·54)	80·65 (80·33–81·01)	71·16 (68·40–73·63)	22·52 (22·31–22·74)	17·40 (15·85–18·73)	19·25 (19·06–19·47)	14·99 (13·77–16·09)
UK	81·14 (81·11–81·18)	70·63 (67·46–73·34)	76·73 (76·70–76·77)	67·86 (65·24–70·12)	82·81 (82·71–82·93)	72·09 (68·88–74·81)	79·03 (78·94–79·13)	69·86 (67·26–72·19)	20·85 (20·77–20·95)	16·41 (15·13–17·54)	18·35 (18·28–18·41)	14·38 (13·28–15·39)
England	81·38 (81·34–81·41)	70·91 (67·74–73·60)	77·05 (77·02–77·09)	68·20 (65·59–70·47)	83·05 (82·94–83·16)	72·37 (69·18–75·11)	79·34 (79·24–79·44)	70·19 (67·61–72·53)	21·01 (20·92–21·10)	16·57 (15·29–17·71)	18·51 (18·44–18·58)	14·54 (13·43–15·54)
Northern Ireland	80·78 (80·57–80·97)	70·40 (67·34–73·09)	75·84 (75·64–76·04)	67·11 (64·54–69·40)	82·30 (81·91–82·68)	71·74 (68·69–74·38)	77·94 (77·50–78·37)	68·98 (66·37–71·31)	20·55 (20·27–20·82)	16·17 (14·89–17·30)	17·67 (17·45–17·89)	13·82 (12·71–14·82)
Scotland	79·48 (79·35–79·61)	68·60 (65·44–71·42)	74·35 (74·23–74·47)	65·43 (62·83–67·70)	81·22 (80·86–81·62)	70·03 (66·77–72·90)	77·15 (76·79–77·50)	67·83 (65·20–70·28)	19·81 (19·57–20·06)	15·35 (14·05–16·49)	17·46 (17·28–17·65)	13·54 (12·45–14·58)
Wales	80·66 (80·53–80·79)	69·95 (66·78–72·73)	76·19 (76·06–76·31)	66·91 (64·19–69·30)	82·16 (81·86–82·46)	71·20 (67·94–74·08)	77·98 (77·69–78·28)	68·39 (65·59–70·88)	20·38 (20·18–20·58)	15·88 (14·57–17·06)	17·63 (17·47–17·79)	13·62 (12·50–14·65)
Southern Latin America	79·29 (79·23–79·34)	69·60 (66·74–72·09)	72·64 (72·58–72·69)	64·83 (62·54–66·87)	80·41 (80·19–80·63)	70·54 (67·61–73·11)	73·98 (73·74–74·23)	66·02 (63·62–68·10)	19·81 (19·67–19·94)	15·78 (14·59–16·82)	15·83 (15·71–15·95)	12·47 (11·47–13·33)
Argentina	78·69 (78·61–78·76)	69·07 (66·24–71·55)	71·78 (71·71–71·85)	64·04 (61·79–66·07)	79·76 (79·51–80·01)	70·00 (67·06–72·53)	73·05 (72·77–73·31)	65·20 (62·88–67·28)	19·55 (19·40–19·69)	15·58 (14·41–16·62)	15·37 (15·23–15·50)	12·10 (11·12–12·94)
Chile	80·97 (80·87–81·08)	71·07 (68·14–73·59)	75·36 (75·26–75·47)	67·21 (64·82–69·31)	82·04 (81·53–82·54)	71·91 (69·01–74·53)	76·56 (75·93–77·19)	68·28 (65·76–70·51)	20·50 (20·15–20·84)	16·30 (15·06–17·39)	17·22 (16·88–17·57)	13·59 (12·47–14·60)
Uruguay	79·15 (78·98–79·31)	69·51 (66·62–71·93)	71·80 (71·65–71·96)	64·33 (62·09–66·28)	80·51 (80·15–80·90)	70·65 (67·77–73·25)	72·93 (72·50–73·37)	65·30 (62·97–67·25)	19·85 (19·65–20·05)	15·80 (14·63–16·86)	15·05 (14·85–15·24)	11·86 (10·90–12·68)
Central Europe, eastern Europe, and central Asia	73·64 (73·53–73·75)	64·25 (61·48–66·73)	62·93 (62·80–63·06)	55·92 (53·84–57·72)	77·31 (77·09–77·50)	67·31 (64·36–69·91)	67·95 (67·71–68·21)	60·13 (57·76–62·14)	17·86 (17·77–17·94)	13·74 (12·56–14·77)	13·97 (13·90–14·04)	10·57 (9·60–11·43)
Eastern Europe	72·72 (72·63–72·80)	63·16 (60·37–65·68)	59·78 (59·65–59·91)	53·18 (51·24–54·89)	76·70 (76·44–76·94)	66·44 (63·45–69·08)	65·73 (65·39–66·05)	58·15 (55·84–60·13)	17·40 (17·27–17·52)	13·30 (12·12–14·33)	13·10 (12·98–13·22)	9·84 (8·90–10·68)
Belarus	74·89 (74·62–75·15)	65·58 (62·91–68·05)	62·76 (62·41–63·09)	55·92 (53·92–57·70)	77·07 (76·58–77·58)	67·38 (64·53–69·96)	65·02 (64·33–65·74)	57·85 (55·63–59·94)	17·05 (16·77–17·32)	13·19 (12·06–14·23)	11·75 (11·47–12·04)	8·86 (8·00–9·68)
Estonia	77·67 (77·51–77·84)	67·79 (64·90–70·36)	67·12 (66·93–67·29)	59·50 (57·27–61·47)	81·43 (80·99–81·88)	71·08 (68·17–73·78)	73·44 (73·07–73·83)	64·89 (62·39–67·14)	19·70 (19·35–20·07)	15·32 (14·07–16·50)	15·61 (15·39–15·85)	11·87 (10·77–12·85)
Latvia	76·63 (76·48–76·78)	66·98 (64·16–69·53)	65·47 (65·32–65·62)	58·12 (55·95–60·04)	79·73 (79·34–80·06)	69·63 (66·64–72·23)	70·59 (70·17–70·99)	62·48 (60·12–64·65)	19·01 (18·79–19·20)	14·70 (13·42–15·80)	14·55 (14·37–14·72)	10·99 (9·97–11·90)
Lithuania	77·71 (77·60–77·82)	67·74 (64·85–70·37)	65·71 (65·60–65·82)	58·22 (55·95–60·15)	80·39 (80·16–80·61)	70·02 (67·03–72·76)	69·72 (69·47–70·02)	61·55 (59·11–63·70)	19·63 (19·49–19·76)	15·11 (13·80–16·26)	14·75 (14·64–14·87)	10·97 (9·87–11·94)
Moldova	73·43 (73·13–73·69)	64·40 (61·73–66·76)	65·55 (65·21–65·82)	58·37 (56·23–60·27)	77·70 (77·29–78·06)	67·96 (65·13–70·54)	69·93 (69·47–70·35)	62·06 (59·81–64·18)	17·39 (17·21–17·58)	13·53 (12·39–14·53)	14·04 (13·91–14·18)	10·71 (9·76–11·57)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Russia	72·21 (72·11–72·30)	62·43 (59·56–64·98)	58·71 (58·54–58·87)	52·21 (50·31–53·88)	76·57 (76·22–76·90)	66·02 (62·89–68·71)	65·30 (64·85–65·77)	57·71 (55·43–59·76)	17·48 (17·29–17·64)	13·26 (12·03–14·31)	13·12 (12·95–13·30)	9·83 (8·86–10·68)
Ukraine	73·16 (72·91–73·37)	64·21 (61·62–66·53)	61·36 (61·08–61·60)	54·64 (52·67–56·37)	76·45 (75·94–76·93)	66·93 (64·21–69·44)	66·26 (65·56–66·93)	58·71 (56·38–60·69)	16·95 (16·73–17·18)	13·15 (12·05–14·14)	12·97 (12·77–13·18)	9·82 (8·90–10·63)
Central Europe	77·90 (77·86–77·94)	68·36 (65·55–70·83)	70·48 (70·44–70·52)	62·43 (60·05–64·51)	80·45 (80·31–80·58)	70·52 (67·59–73·06)	73·43 (73·25–73·59)	64·92 (62·42–67·13)	19·05 (18·98–19·11)	14·80 (13·54–15·90)	15·33 (15·26–15·39)	11·65 (10·59–12·59)
Albania	79·08 (78·63–79·52)	69·12 (66·18–71·74)	73·49 (72·96–74·00)	64·65 (62·01–66·95)	81·32 (80·71–81·95)	71·17 (68·10–73·74)	74·98 (74·10–75·87)	66·20 (63·43–68·64)	20·06 (19·65–20·47)	15·65 (14·28–16·89)	16·09 (15·36–16·99)	12·34 (11·10–13·63)
Bosnia and Herzegovina	79·89 (79·75–80·05)	69·96 (67·03–72·56)	74·05 (73·91–74·23)	65·08 (62·52–67·36)	81·82 (81·45–82·21)	71·51 (68·53–74·24)	76·00 (75·72–76·30)	66·69 (64·02–69·04)	20·09 (19·81–20·38)	15·56 (14·25–16·76)	16·64 (16·51–16·81)	12·59 (11·45–13·61)
Bulgaria	76·22 (76·11–76·34)	67·07 (64·38–69·46)	69·07 (68·95–69·17)	61·35 (59·08–63·34)	78·36 (77·90–78·80)	68·88 (66·09–71·34)	71·37 (70·84–71·87)	63·34 (60·91–65·43)	17·54 (17·26–17·79)	13·67 (12·53–14·68)	14·14 (13·91–14·37)	10·78 (9·80–11·69)
Croatia	79·21 (79·07–79·35)	69·34 (66·46–71·92)	72·01 (71·89–72·12)	63·67 (61·24–65·84)	80·92 (80·61–81·26)	70·74 (67·69–73·39)	74·65 (74·31–75·00)	65·87 (63·30–68·12)	18·92 (18·71–19·15)	14·64 (13·35–15·72)	15·39 (15·20–15·58)	11·70 (10·64–12·64)
Czech Republic	79·37 (79·28–79·47)	69·51 (66·58–72·10)	72·98 (72·90–73·06)	64·55 (62·06–66·73)	81·65 (81·47–81·83)	71·41 (68·37–74·06)	75·92 (75·73–76·11)	66·94 (64·35–69·27)	19·46 (19·33–19·59)	15·05 (13·78–16·19)	16·06 (15·96–16·17)	12·13 (11·00–13·14)
Hungary	77·25 (77·14–77·34)	67·48 (64·65–70·00)	68·82 (68·73–68·91)	61·06 (58·81–63·06)	79·95 (79·55–80·34)	69·76 (66·77–72·32)	73·22 (72·78–73·68)	64·71 (62·24–66·94)	19·00 (18·75–19·23)	14·59 (13·27–15·70)	15·41 (15·20–15·63)	11·65 (10·56–12·61)
Macedonia	76·41 (76·25–76·57)	67·48 (64·89–69·82)	71·36 (71·20–71·51)	63·45 (61·07–65·54)	79·14 (78·63–79·65)	69·66 (66·84–72·23)	73·92 (73·30–74·51)	65·54 (63·08–67·75)	17·94 (17·65–18·28)	13·95 (12·78–15·05)	15·06 (14·67–15·47)	11·50 (10·47–12·50)
Montenegro	77·96 (77·70–78·22)	68·56 (65·82–71·10)	71·99 (71·77–72·22)	63·70 (61·25–65·88)	80·18 (79·69–80·68)	70·44 (67·53–73·02)	74·21 (73·61–74·86)	65·59 (63·03–67·89)	18·94 (18·63–19·25)	14·76 (13·53–15·90)	15·64 (15·26–16·09)	11·95 (10·83–12·96)
Poland	79·36 (79·31–79·41)	69·57 (66·70–72·07)	70·78 (70·73–70·83)	62·67 (60·24–64·74)	81·61 (81·39–81·81)	71·53 (68·56–74·11)	73·45 (73·23–73·69)	64·96 (62·44–67·15)	19·98 (19·86–20·10)	15·51 (14·22–16·67)	15·56 (15·46–15·66)	11·82 (10·74–12·79)
Romania	76·08 (76·00–76·17)	66·92 (64·24–69·30)	68·82 (68·75–68·90)	61·04 (58·74–63·06)	78·99 (78·59–79·36)	69·44 (66·68–71·90)	71·52 (71·03–72·00)	63·40 (60·98–65·54)	18·15 (17·92–18·37)	14·25 (13·12–15·26)	14·55 (14·34–14·77)	11·14 (10·15–12·04)
Serbia	75·94 (75·71–76·15)	66·88 (64·26–69·26)	70·58 (70·36–70·80)	62·59 (60·22–64·67)	78·87 (78·69–79·05)	69·23 (66·44–71·75)	73·48 (73·20–73·71)	64·90 (62·35–67·11)	17·88 (17·77–17·99)	13·85 (12·68–14·89)	15·18 (15·02–15·31)	11·52 (10·46–12·47)
Slovakia	78·18 (78·06–78·30)	68·72 (65·92–71·18)	70·28 (70·16–70·39)	62·14 (59·72–64·26)	80·92 (80·69–81·14)	70·92 (68·01–73·52)	73·98 (73·74–74·21)	65·21 (62·65–67·47)	19·18 (19·03–19·33)	14·90 (13·67–16·05)	15·38 (15·26–15·49)	11·60 (10·53–12·55)
Slovenia	81·07 (80·92–81·20)	70·80 (67·77–73·46)	73·89 (73·76–74·01)	65·25 (62·75–67·47)	83·84 (83·62–84·05)	73·21 (70·12–75·94)	77·94 (77·71–78·18)	68·66 (65·91–71·09)	21·31 (21·16–21·47)	16·54 (15·13–17·77)	17·55 (17·42–17·68)	13·39 (12·17–14·47)
Central Asia	71·47 (71·12–71·80)	62·79 (60·19–65·08)	63·62 (63·27–63·98)	56·73 (54·69–58·52)	75·30 (74·77–75·76)	65·96 (63·27–68·44)	67·41 (66·85–67·91)	59·93 (57·71–61·94)	16·95 (16·75–17·17)	13·14 (12·03–14·15)	13·48 (13·32–13·66)	10·35 (9·44–11·16)
Armenia	75·32 (74·82–75·77)	65·81 (63·07–68·24)	68·18 (67·64–68·75)	60·65 (58·47–62·68)	78·37 (77·89–78·95)	68·40 (65·51–70·99)	70·75 (70·05–71·47)	62·84 (60·47–65·01)	18·06 (17·85–18·44)	13·83 (12·63–14·95)	14·37 (14·13–14·66)	10·99 (9·99–11·87)
Azerbaijan	71·39 (70·61–72·13)	62·63 (59·91–65·16)	65·10 (64·27–65·92)	58·10 (55·95–60·12)	76·32 (75·59–77·07)	66·67 (63·73–69·41)	69·57 (68·51–70·58)	61·78 (59·33–63·98)	17·57 (17·25–17·90)	13·56 (12·32–14·64)	14·46 (13·77–14·96)	11·12 (10·05–12·10)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Georgia	76·02 (75·39–76·63)	67·04 (64·39–69·40)	67·40 (66·60–68·21)	60·26 (58·09–62·26)	78·04 (77·27–78·74)	68·48 (65·63–71·10)	67·86 (66·87–69·05)	60·52 (58·23–62·66)	18·13 (17·73–18·55)	14·12 (12·89–15·23)	13·23 (12·89–13·73)	10·15 (9·21–11·06)
Kazakhstan	71·06 (70·70–71·40)	62·23 (59·70–64·57)	59·79 (59·41–60·14)	53·24 (51·28–54·98)	75·03 (74·05–75·95)	65·52 (62·54–68·31)	65·29 (64·11–66·49)	57·91 (55·58–60·11)	16·49 (16·00–16·99)	12·70 (11·53–13·82)	12·66 (12·21–13·13)	9·60 (8·68–10·47)
Kyrgyzstan	70·68 (70·16–71·20)	62·06 (59·52–64·39)	62·56 (61·96–63·23)	55·92 (53·99–57·76)	74·10 (73·44–74·71)	64·92 (62·25–67·31)	65·60 (64·83–66·41)	58·62 (56·46–60·57)	16·13 (15·81–16·47)	12·55 (11·47–13·49)	12·64 (12·31–12·98)	9·79 (8·91–10·58)
Mongolia	67·72 (67·00–68·42)	60·10 (57·87–62·07)	59·95 (59·16–60·71)	53·54 (51·58–55·43)	71·87 (71·03–72·67)	63·55 (61·09–65·93)	62·78 (61·90–63·63)	55·92 (53·79–57·96)	15·12 (14·80–15·43)	11·73 (10·76–12·66)	11·78 (11·55–12·05)	8·94 (8·13–9·73)
Tajikistan	70·16 (69·42–70·88)	61·79 (59·20–64·06)	65·92 (65·24–66·65)	58·68 (56·48–60·63)	74·80 (73·94–75·53)	65·67 (63·00–68·18)	70·12 (69·20–70·96)	62·17 (59·71–64·38)	16·91 (16·48–17·22)	13·20 (12·13–14·21)	15·04 (14·71–15·31)	11·61 (10·61–12·52)
Turkmenistan	69·51 (68·21–70·74)	61·31 (58·75–63·67)	62·12 (60·77–63·27)	55·49 (53·35–57·52)	73·69 (72·71–74·46)	64·83 (62·09–67·28)	66·33 (65·35–67·15)	59·11 (56·86–61·15)	16·78 (16·53–17·01)	13·09 (11·99–14·06)	13·57 (13·32–13·79)	10·47 (9·58–11·31)
Uzbekistan	71·50 (70·65–72·29)	62·93 (60·29–65·29)	65·48 (64·61–66·40)	58·39 (56·15–60·45)	75·20 (74·34–76·03)	66·03 (63·32–68·49)	68·37 (67·51–69·27)	60·85 (58·49–63·00)	16·77 (16·40–17·33)	13·10 (11·98–14·12)	13·69 (13·42–14·00)	10·59 (9·67–11·42)
Latin America and Caribbean	76·49 (76·28–76·69)	66·42 (63·49–69·02)	70·45 (70·24–70·68)	62·25 (59·82–64·38)	78·25 (77·87–78·62)	67·88 (64·80–70·50)	72·20 (71·73–72·62)	63·76 (61·28–65·91)	18·85 (18·69–19·02)	14·38 (13·08–15·51)	16·25 (16·11–16·40)	12·45 (11·37–13·42)
Central Latin America	77·58 (77·40–77·75)	67·68 (64·81–70·20)	71·92 (71·72–72·11)	63·73 (61·30–65·83)	78·81 (78·44–79·15)	68·69 (65·67–71·26)	73·28 (72·84–73·72)	64·88 (62·36–67·07)	19·06 (18·95–19·19)	14·51 (13·21–15·68)	16·97 (16·86–17·09)	13·05 (11·91–14·05)
Colombia	78·26 (78·06–78·46)	68·20 (65·23–70·78)	72·02 (71·80–72·23)	64·05 (61·65–66·08)	80·80 (80·35–81·25)	70·21 (67·06–72·90)	75·15 (74·58–75·65)	66·65 (64·15–68·88)	20·06 (19·85–20·28)	15·33 (13·95–16·52)	17·46 (17·28–17·64)	13·55 (12·44–14·57)
Costa Rica	81·47 (81·22–81·69)	70·96 (67·85–73·65)	76·56 (76·27–76·80)	67·84 (65·19–70·12)	82·60 (82·12–83·05)	71·84 (68·61–74·60)	78·08 (77·50–78·58)	69·11 (66·46–71·44)	21·24 (20·99–21·51)	16·24 (14·85–17·48)	18·90 (18·66–19·12)	14·67 (13·44–15·77)
El Salvador	77·02 (76·56–77·45)	66·63 (63·59–69·35)	68·79 (68·07–69·49)	60·84 (58·45–62·88)	78·94 (78·06–79·85)	68·24 (64·99–71·16)	70·57 (69·32–71·94)	62·56 (60·03–64·95)	19·55 (19·10–20·06)	14·80 (13·36–16·08)	17·79 (17·33–18·24)	13·74 (12·56–14·87)
Guatemala	73·16 (72·79–73·54)	63·27 (60·37–65·90)	66·41 (66·08–66·75)	58·31 (55·91–60·44)	75·20 (73·54–77·05)	65·09 (61·95–68·07)	69·81 (67·75–71·79)	61·33 (58·45–64·12)	17·38 (16·41–18·60)	13·02 (11·59–14·44)	17·18 (16·45–17·95)	13·09 (11·85–14·29)
Honduras	72·00 (69·46–74·83)	63·00 (59·75–66·13)	70·45 (67·22–72·91)	62·58 (59·11–65·60)	73·95 (71·41–76·68)	64·71 (61·55–68·01)	72·09 (68·69–74·71)	64·07 (60·73–67·10)	16·30 (15·18–17·86)	12·48 (11·19–13·99)	16·08 (14·54–17·25)	12·49 (11·04–13·84)
Mexico	77·72 (77·45–77·95)	68·16 (65·42–70·62)	72·54 (72·25–72·81)	64·56 (62·22–66·64)	78·32 (77·98–78·60)	68·64 (65·82–71·11)	73·43 (73·04–73·75)	65·26 (62·82–67·38)	18·65 (18·59–18·70)	14·24 (12·98–15·37)	16·78 (16·74–16·83)	12·91 (11·78–13·91)
Nicaragua	79·26 (78·69–79·76)	69·03 (65·97–71·74)	73·74 (73·07–74·37)	65·25 (62·65–67·57)	80·76 (79·93–81·68)	70·31 (67·22–73·07)	75·01 (73·80–76·26)	66·47 (63·72–69·01)	20·76 (20·25–21·30)	15·88 (14·42–17·17)	18·30 (17·75–18·85)	14·19 (12·90–15·41)
Panama	79·72 (79·09–80·35)	69·27 (66·25–72·03)	74·77 (73·98–75·48)	66·08 (63·42–68·38)	81·01 (79·82–82·22)	70·21 (66·90–73·23)	75·48 (73·89–76·95)	66·63 (63·75–69·40)	20·93 (20·19–21·70)	15·90 (14·35–17·37)	18·34 (17·55–19·16)	14·11 (12·76–15·39)
Venezuela	78·22 (78·11–78·32)	67·39 (64·28–70·19)	71·17 (71·06–71·27)	61·93 (59·15–64·31)	79·16 (78·00–80·36)	68·14 (64·68–71·24)	70·69 (69·02–72·41)	61·62 (58·62–64·44)	19·37 (18·64–20·13)	14·58 (13·09–15·96)	16·05 (15·37–16·77)	12·05 (10·85–13·25)
Andean Latin America	76·76 (76·30–77·23)	66·92 (64·06–69·48)	73·09 (72·59–73·57)	64·22 (61·57–66·57)	79·01 (78·22–79·82)	68·86 (65·87–71·66)	75·40 (74·51–76·28)	66·26 (63·43–68·85)	19·24 (18·74–19·76)	14·90 (13·63–16·14)	17·61 (17·15–18·06)	13·44 (12·14–14·60)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Bolivia	71·40 (69·86–72·67)	62·29 (59·64–64·88)	69·02 (67·91–70·15)	60·74 (58·14–63·17)	74·22 (72·07–76·43)	64·65 (61·20–67·81)	72·11 (69·61–74·23)	63·35 (60·22–66·40)	16·64 (15·46–18·07)	12·80 (11·36–14·26)	16·33 (15·07–17·17)	12·41 (11·10–13·67)
Ecuador	76·85 (76·33–77·36)	66·94 (63·96–69·56)	71·53 (70·79–72·19)	62·95 (60·31–65·29)	78·56 (77·59–79·50)	68·39 (65·41–71·20)	73·35 (72·06–74·39)	64·57 (61·56–67·16)	18·94 (18·40–19·46)	14·57 (13·33–15·81)	16·49 (15·80–17·02)	12·48 (11·14–13·66)
Peru	78·80 (78·19–79·39)	68·71 (65·77–71·33)	75·55 (74·73–76·36)	66·30 (63·53–68·76)	81·10 (80·01–82·23)	70·74 (67·67–73·66)	77·85 (76·38–79·13)	68·37 (65·44–71·13)	20·44 (19·71–21·22)	15·93 (14·52–17·30)	18·78 (18·02–19·53)	14·42 (13·06–15·70)
Caribbean	72·72 (71·92–73·44)	63·17 (60·25–65·76)	69·08 (68·51–69·68)	60·88 (58·42–63·12)	75·21 (73·88–76·31)	65·16 (61·96–67·91)	70·92 (69·92–71·88)	62·43 (59·83–64·66)	18·22 (17·84–18·59)	14·04 (12·77–15·10)	16·18 (15·97–16·43)	12·47 (11·39–13·43)
Antigua and Barbuda	77·20 (76·51–78·00)	67·21 (64·20–69·87)	72·45 (71·58–73·41)	63·69 (61·07–66·03)	78·85 (78·10–79·78)	68·54 (65·44–71·37)	73·78 (72·68–75·33)	64·92 (62·16–67·47)	18·43 (18·03–19·10)	14·28 (13·02–15·46)	15·57 (14·73–16·84)	11·90 (10·54–13·37)
The Bahamas	74·43 (73·70–75·22)	64·60 (61·75–67·14)	68·91 (67·92–69·86)	60·65 (58·19–62·97)	76·41 (75·13–77·73)	66·24 (63·14–69·13)	70·87 (69·42–72·31)	62·47 (59·69–65·04)	17·58 (16·97–18·24)	13·49 (12·26–14·70)	15·42 (14·86–16·14)	11·79 (10·61–12·96)
Barbados	76·96 (76·19–77·73)	66·70 (63·63–69·54)	72·90 (72·17–73·53)	64·11 (61·48–66·54)	77·56 (76·24–78·67)	67·12 (63·92–69·93)	73·63 (72·28–74·85)	64·84 (62·02–67·46)	18·05 (17·34–18·64)	13·81 (12·54–15·06)	16·09 (15·12–16·78)	12·29 (10·96–13·53)
Belize	73·08 (72·37–73·77)	63·66 (60·85–66·10)	67·27 (66·44–68·11)	59·58 (57·17–61·66)	74·73 (73·67–75·77)	65·00 (62·11–67·76)	69·05 (67·70–70·29)	61·18 (58·61–63·64)	16·75 (16·23–17·30)	12·97 (11·80–14·04)	14·44 (13·90–15·11)	11·19 (10·17–12·20)
Bermuda	79·60 (79·07–80·17)	69·18 (66·21–72·01)	73·35 (72·73–74·01)	64·74 (62·22–67·06)	82·23 (81·24–83·29)	71·28 (68·14–74·12)	75·00 (73·93–75·97)	66·15 (63·61–68·57)	20·38 (19·75–21·11)	15·80 (14·45–17·03)	16·27 (15·84–16·62)	12·53 (11·43–13·52)
Cuba	79·14 (79·04–79·22)	68·94 (65·93–71·55)	75·19 (75·09–75·27)	66·68 (64·14–68·92)	80·60 (80·24–80·97)	70·06 (66·98–72·80)	75·87 (75·52–76·25)	67·22 (64·76–69·45)	19·56 (19·34–19·79)	15·16 (13·88–16·31)	16·68 (16·50–16·87)	13·01 (11·96–13·95)
Dominica	77·15 (76·26–77·93)	66·87 (63·91–69·60)	71·36 (70·25–72·27)	62·42 (59·76–64·84)	76·81 (75·46–78·06)	66·52 (63·28–69·40)	69·71 (67·83–71·50)	61·07 (58·09–63·74)	18·29 (17·55–18·86)	14·04 (12·66–15·26)	14·93 (14·01–15·94)	11·25 (9·97–12·50)
Dominican Republic	76·16 (75·51–76·65)	66·32 (63·46–68·91)	70·75 (70·04–71·40)	62·43 (59·94–64·68)	77·93 (77·41–78·30)	67·89 (64·83–70·38)	72·82 (71·86–73·45)	64·36 (61·78–66·67)	19·04 (18·91–19·11)	14·78 (13·55–15·85)	16·79 (16·51–16·90)	12·99 (11·86–13·96)
Grenada	73·36 (72·61–74·08)	63·76 (60·97–66·16)	67·21 (66·38–67·95)	59·21 (56·81–61·43)	74·28 (72·93–75·36)	64·40 (61·31–67·09)	68·78 (67·50–70·02)	60·56 (57·89–62·93)	16·30 (15·74–16·82)	12·50 (11·33–13·54)	13·99 (13·53–14·41)	10·61 (9·51–11·52)
Guyana	67·83 (66·96–68·68)	58·96 (56·30–61·42)	61·28 (60·22–62·33)	54·11 (51·88–56·20)	70·47 (68·95–71·86)	61·22 (58·26–64·03)	63·47 (61·70–65·26)	56·08 (53·43–58·62)	14·88 (14·21–15·47)	11·43 (10·35–12·47)	12·55 (12·03–13·14)	9·57 (8·67–10·50)
Haiti	59·86 (57·33–62·32)	51·93 (48·83–54·97)	60·30 (58·18–62·80)	52·84 (50·10–55·64)	64·74 (61·22–68·20)	55·81 (51·95–59·24)	63·91 (60·58–67·20)	55·75 (52·32–59·08)	13·37 (11·94–15·07)	10·09 (8·77–11·46)	14·01 (12·88–15·32)	10·54 (9·30–11·84)
Jamaica	76·72 (75·84–77·43)	66·45 (63·40–69·28)	73·96 (72·94–74·84)	64·93 (62·19–67·48)	76·97 (75·72–78·20)	66·55 (63·15–69·48)	73·03 (71·74–74·36)	64·18 (61·35–66·78)	18·00 (17·35–18·77)	13·85 (12·48–15·08)	16·43 (15·55–17·11)	12·65 (11·39–13·78)
Puerto Rico	80·24 (80·07–80·41)	69·47 (66·33–72·22)	72·85 (72·67–73·00)	63·94 (61·31–66·24)	81·77 (81·16–82·37)	70·70 (67·45–73·61)	75·03 (74·35–75·73)	65·70 (62·92–68·26)	20·43 (20·03–20·83)	15·71 (14·34–16·94)	17·42 (17·11–17·72)	13·17 (11·95–14·31)
Saint Lucia	76·14 (75·26–77·06)	66·13 (63·23–68·75)	70·19 (69·24–71·13)	61·74 (59·30–63·99)	77·09 (75·75–78·29)	66·91 (63·83–69·68)	72·52 (71·02–73·92)	63·78 (61·01–66·41)	17·82 (17·13–18·53)	13·74 (12·49–14·93)	16·08 (15·41–16·73)	12·35 (11·12–13·45)
Saint Vincent and the Grenadines	73·00 (72·20–73·75)	63·48 (60·67–65·95)	68·03 (67·29–68·71)	59·90 (57·52–62·10)	73·95 (72·82–75·00)	64·26 (61·26–66·93)	68·77 (67·61–69·89)	60·59 (58·00–62·87)	16·11 (15·64–16·62)	12·39 (11·28–13·41)	14·09 (13·51–14·61)	10·71 (9·59–11·71)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Suriname	72·74 (71·94–73·56)	63·29 (60·51–65·80)	67·08 (66·13–68·21)	59·30 (56·87–61·54)	75·34 (73·89–76·55)	65·50 (62·51–68·45)	68·82 (67·09–70·46)	60·87 (58·15–63·47)	17·81 (16·90–18·46)	13·79 (12·48–15·07)	14·97 (13·93–15·94)	11·60 (10·37–12·83)
Trinidad and Tobago	74·55 (74·07–74·94)	64·63 (61·71–67·22)	67·83 (67·34–68·24)	59·72 (57·26–61·89)	76·11 (74·90–77·24)	65·86 (62·82–68·63)	68·88 (67·40–70·26)	60·56 (57·82–63·02)	17·70 (17·11–18·26)	13·58 (12·32–14·73)	14·01 (13·42–14·55)	10·64 (9·59–11·68)
Virgin Islands	78·01 (77·51–78·52)	67·81 (64·87–70·40)	70·91 (70·26–71·53)	62·41 (59·95–64·67)	78·72 (77·88–79·47)	68·35 (65·40–71·18)	70·34 (68·90–71·64)	62·04 (59·52–64·54)	18·47 (18·11–18·79)	14·26 (13·03–15·36)	14·52 (13·95–15·13)	11·03 (10·04–12·07)
Tropical Latin America	76·21 (75·81–76·58)	65·73 (62·71–68·45)	68·77 (68·38–69·19)	60·66 (58·25–62·82)	78·18 (77·61–78·70)	67·36 (64·20–70·06)	70·75 (70·08–71·38)	62·38 (59·89–64·58)	18·72 (18·37–19·08)	14·21 (12·88–15·37)	15·33 (15·06–15·65)	11·70 (10·66–12·65)
Brazil	76·21 (75·81–76·59)	65·73 (62·70–68·46)	68·69 (68·28–69·12)	60·58 (58·18–62·74)	78·21 (77·63–78·74)	67·38 (64·24–70·09)	70·72 (70·02–71·35)	62·35 (59·87–64·54)	18·74 (18·38–19·11)	14·23 (12·89–15·40)	15·32 (15·05–15·65)	11·70 (10·65–12·65)
Paraguay	76·10 (75·16–77·01)	65·86 (62·81–68·66)	72·03 (71·11–72·86)	63·47 (60·86–65·87)	76·95 (75·54–78·38)	66·44 (63·14–69·64)	72·09 (70·20–73·79)	63·54 (60·38–66·19)	17·79 (17·02–18·72)	13·48 (12·10–14·92)	15·74 (14·84–16·55)	12·01 (10·72–13·22)
Southeast Asia, east Asia, and Oceania	73·95 (73·58–74·33)	65·33 (62·87–67·58)	68·52 (68·12–68·95)	61·40 (59·27–63·32)	78·38 (77·84–78·93)	69·11 (66·39–71·55)	71·90 (71·26–72·50)	64·36 (62·09–66·41)	18·48 (18·12–18·87)	14·53 (13·45–15·60)	14·95 (14·63–15·29)	11·86 (10·97–12·70)
East Asia	74·94 (74·46–75·43)	66·54 (64·09–68·73)	69·38 (68·86–69·89)	62·44 (60·36–64·35)	79·83 (79·19–80·49)	70·71 (67·99–73·12)	73·17 (72·45–73·88)	65·74 (63·45–67·78)	18·99 (18·51–19·50)	15·07 (13·98–16·18)	15·13 (14·73–15·54)	12·09 (11·18–12·92)
China	74·90 (74·41–75·40)	66·53 (64·05–68·73)	69·33 (68·82–69·86)	62·40 (60·32–64·31)	79·89 (79·24–80·56)	70·78 (68·07–73·23)	73·19 (72·44–73·91)	65·75 (63·43–67·77)	19·01 (18·52–19·57)	15·11 (14·00–16·22)	15·10 (14·68–15·50)	12·07 (11·16–12·90)
North Korea	72·55 (69·82–75·12)	64·12 (60·50–67·12)	67·53 (64·35–71·01)	60·93 (57·56–64·20)	74·89 (72·19–77·52)	66·20 (62·62–69·50)	68·94 (65·72–71·93)	62·22 (58·78–65·27)	16·59 (15·35–17·90)	13·02 (11·60–14·42)	13·94 (12·91–15·25)	11·14 (10·00–12·41)
Taiwan (province of China)	80·69 (80·57–80·81)	70·76 (67·85–73·30)	74·48 (74·38–74·60)	66·78 (64·52–68·76)	82·50 (81·18–83·87)	72·18 (68·93–75·14)	76·64 (75·07–78·27)	68·54 (65·66–71·16)	20·75 (19·81–21·71)	16·11 (14·63–17·56)	17·83 (17·04–18·69)	14·14 (12·85–15·40)
Southeast Asia	72·16 (71·46–72·89)	62·99 (60·28–65·42)	67·08 (66·24–68·00)	59·39 (57·12–61·51)	75·32 (74·30–76·32)	65·77 (63·04–68·45)	69·18 (67·96–70·46)	61·37 (58·95–63·67)	17·10 (16·64–17·58)	13·05 (11·88–14·14)	14·32 (13·85–14·99)	11·02 (10·03–12·01)
Cambodia	66·24 (65·34–67·27)	57·67 (55·12–60·05)	61·53 (60·48–62·59)	54·41 (52·18–56·48)	72·44 (70·47–74·65)	63·20 (60·14–66·32)	66·21 (64·31–68·00)	58·76 (56·24–61·37)	15·49 (14·72–16·72)	11·80 (10·60–13·12)	13·09 (12·36–13·71)	10·05 (9·12–11·01)
Indonesia	70·11 (69·16–71·14)	61·40 (58·93–63·80)	67·35 (66·18–68·63)	59·63 (57·19–61·78)	73·29 (71·23–75·39)	64·06 (61·07–66·97)	69·01 (66·64–71·91)	61·21 (58·27–64·28)	15·80 (15·03–16·90)	11·97 (10·81–13·15)	14·17 (13·25–15·79)	10·88 (9·66–12·36)
Laos	62·05 (60·33–63·86)	54·26 (51·70–56·65)	58·08 (56·59–59·47)	51·31 (49·04–53·42)	69·48 (66·71–72·17)	60·75 (57·56–63·91)	64·73 (62·17–67·51)	57·20 (54·14–60·31)	15·26 (13·95–16·63)	11·60 (10·20–13·00)	13·78 (12·78–14·71)	10·49 (9·37–11·60)
Malaysia	76·30 (76·22–76·37)	66·76 (64·04–69·16)	72·35 (72·27–72·44)	64·08 (61·75–66·23)	78·62 (77·72–79·60)	68·60 (65·64–71·42)	72·39 (70·75–74·04)	64·21 (61·50–66·73)	17·89 (17·46–18·39)	13·71 (12·45–14·86)	15·16 (14·29–16·00)	11·79 (10·61–12·90)
Maldives	78·22 (77·80–78·65)	67·35 (64·31–70·02)	75·73 (75·17–76·25)	66·24 (63·45–68·64)	82·26 (81·00–83·52)	71·20 (68·08–74·17)	78·06 (76·40–79·63)	68·79 (65·73–71·60)	20·80 (19·93–21·72)	15·90 (14·43–17·29)	18·29 (17·22–19·27)	14·17 (12·75–15·45)
Mauritius	75·67 (75·40–75·92)	66·47 (63·85–68·76)	69·17 (68·91–69·42)	61·68 (59·50–63·58)	77·70 (77·09–78·26)	67·92 (65·14–70·41)	71·40 (70·82–72·07)	63·38 (60·98–65·51)	17·89 (17·56–18·24)	13·70 (12·52–14·77)	14·77 (14·50–15·10)	11·39 (10·39–12·27)
Myanmar	66·02 (61·76–70·84)	57·67 (53·57–61·94)	60·74 (56·24–65·94)	53·78 (49·53–58·22)	71·20 (66·85–75·28)	62·24 (58·07–66·28)	64·92 (60·29–69·96)	57·56 (53·22–61·91)	15·05 (13·25–17·14)	11·36 (9·68–13·07)	12·90 (11·42–15·11)	9·82 (8·39–11·59)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Philippines	73·03 (72·88–73·18)	63·05 (60·16–65·57)	65·43 (65·27–65·58)	57·69 (55·43–59·66)	74·41 (73·36–75·31)	64·43 (61·55–67·10)	67·71 (66·63–68·76)	59·82 (57·37–61·95)	16·55 (16·00–17·05)	12·50 (11·34–13·58)	13·19 (12·72–13·67)	10·03 (9·09–10·89)
Sri Lanka	77·97 (77·72–78·23)	68·07 (65·20–70·58)	70·10 (69·85–70·36)	62·08 (59·74–64·13)	81·19 (79·06–83·24)	70·84 (67·31–73·92)	74·05 (71·09–76·93)	65·47 (61·81–68·87)	19·88 (18·47–21·33)	15·31 (13·60–16·89)	16·64 (15·29–18·11)	12·85 (11·28–14·39)
Seychelles	75·88 (75·41–76·46)	66·68 (64·02–69·12)	68·23 (67·63–68·81)	60·74 (58·52–62·75)	77·93 (76·78–78·97)	68·29 (65·52–70·95)	70·55 (68·82–72·14)	62·77 (60·08–65·25)	17·98 (17·48–18·44)	13·81 (12·63–14·94)	14·50 (13·82–15·26)	11·13 (10·05–12·20)
Thailand	76·50 (75·95–77·06)	66·91 (64·21–69·39)	69·77 (68·82–70·76)	61·78 (59·27–64·01)	78·98 (77·47–80·46)	69·11 (66·04–72·23)	70·81 (68·74–73·24)	62·92 (60·29–65·67)	18·77 (18·08–19·63)	14·48 (13·16–15·80)	14·97 (14·25–16·20)	11·59 (10·51–12·79)
Timor-Leste	68·04 (66·22–69·89)	59·73 (57·05–62·44)	66·97 (65·35–68·64)	58·74 (55·92–61·30)	72·96 (70·01–75·75)	64·02 (60·49–67·35)	71·98 (68·85–75·12)	63·08 (59·32–66·79)	16·40 (14·96–17·76)	12·60 (11·07–14·05)	16·61 (15·28–18·13)	12·61 (11·10–14·17)
Vietnam	76·96 (74·35–79·23)	67·23 (63·76–70·40)	69·45 (66·39–72·95)	61·89 (58·50–65·51)	79·38 (77·02–82·25)	69·76 (66·41–73·20)	71·31 (67·83–74·84)	63·80 (60·25–67·14)	18·83 (17·64–20·57)	14·65 (13·11–16·41)	14·75 (13·69–16·34)	11·58 (10·33–13·06)
Oceania	60·94 (56·86–65·01)	52·15 (48·22–56·06)	59·03 (55·23–63·02)	52·11 (48·32–55·82)	63·72 (58·96–67·73)	54·48 (49·99–58·41)	61·42 (57·02–65·32)	54·24 (50·11–57·86)	11·91 (10·33–13·38)	8·73 (7·39–10·01)	11·74 (10·65–12·99)	8·86 (7·77–10·03)
American Samoa	74·63 (72·98–75·91)	64·66 (61·63–67·36)	69·55 (67·93–71·11)	61·14 (58·40–63·76)	74·85 (72·39–77·07)	64·86 (61·72–68·10)	70·87 (68·59–73·17)	62·33 (59·32–65·44)	16·17 (14·98–17·31)	12·17 (10·85–13·56)	14·46 (13·64–15·44)	10·94 (9·80–12·13)
Federated States of Micronesia	69·93 (64·32–74·51)	61·17 (55·63–65·47)	65·36 (60·00–70·18)	58·15 (52·88–62·29)	71·54 (65·30–75·82)	62·52 (56·78–66·79)	66·52 (60·42–70·80)	59·17 (53·52–63·30)	14·60 (11·87–16·79)	11·12 (8·75–13·02)	12·96 (10·83–14·41)	9·94 (8·07–11·30)
Fiji	67·13 (65·42–68·78)	58·07 (55·19–60·77)	62·69 (60·85–64·52)	55·18 (52·48–57·81)	68·13 (65·45–70·87)	58·97 (55·62–62·18)	63·69 (60·77–66·48)	56·19 (53·06–59·16)	13·44 (12·28–14·61)	10·05 (8·82–11·33)	11·87 (10·99–12·73)	8·97 (7·99–10·00)
Guam	76·52 (75·37–77·64)	65·90 (62·55–68·94)	70·07 (68·71–71·26)	62·30 (60·02–64·56)	75·31 (73·53–77·29)	64·87 (61·61–67·99)	68·49 (66·20–70·79)	60·87 (58·19–63·57)	16·69 (15·95–17·72)	12·55 (11·35–13·79)	13·65 (12·85–14·37)	10·52 (9·51–11·52)
Kiribati	64·94 (62·65–67·10)	56·02 (52·94–58·91)	56·94 (54·59–59·28)	50·14 (47·27–52·89)	67·44 (64·55–70·21)	58·34 (54·91–61·62)	58·85 (55·69–61·78)	52·04 (48·74–55·23)	13·39 (12·31–14·42)	10·04 (8·86–11·15)	10·74 (9·94–11·52)	8·13 (7·19–9·08)
Marshall Islands	66·83 (64·59–68·99)	57·26 (54·03–60·39)	62·73 (60·79–64·89)	54·83 (52·07–57·66)	69·50 (66·96–71·91)	59·42 (55·77–62·90)	64·57 (61·96–67·29)	56·37 (53·19–59·53)	13·79 (12·65–14·83)	10·12 (8·77–11·43)	12·42 (11·59–13·18)	9·23 (8·14–10·25)
Northern Mariana Islands	77·39 (76·65–78·14)	67·32 (64·34–69·95)	74·55 (73·60–75·36)	65·91 (63·22–68·16)	78·47 (77·15–79·64)	68·26 (65·13–71·21)	74·17 (72·71–75·49)	65·64 (62·87–68·11)	18·21 (17·55–18·80)	13·88 (12·59–15·11)	15·92 (15·26–16·49)	12·28 (11·15–13·36)
Papua New Guinea	58·54 (53·42–63·88)	49·82 (45·14–54·61)	57·25 (52·39–62·71)	50·55 (45·95–55·57)	61·85 (55·97–67·04)	52·62 (47·33–57·26)	60·13 (54·55–65·30)	53·11 (47·99–57·67)	11·07 (9·04–13·12)	8·02 (6·41–9·61)	11·34 (9·73–13·22)	8·52 (7·14–10·11)
Samoa	73·70 (71·66–75·83)	64·10 (60·84–67·21)	70·00 (67·91–71·97)	61·81 (58·87–64·79)	74·22 (71·79–76·62)	64·45 (60·99–67·91)	72·23 (69·74–74·55)	63·58 (60·54–66·60)	15·96 (14·76–17·15)	12·06 (10·65–13·56)	15·02 (14·00–16·06)	11·45 (10·19–12·72)
Solomon Islands	62·69 (57·49–68·21)	54·94 (50·49–59·82)	60·93 (56·04–65·96)	54·44 (50·20–58·93)	65·12 (59·19–70·81)	56·98 (51·74–61·79)	62·86 (56·96–68·13)	56·07 (51·03–60·69)	11·78 (9·54–14·16)	8·95 (7·07–10·81)	11·83 (9·87–13·36)	9·10 (7·53–10·52)
Tonga	72·70 (71·27–73·99)	62·79 (59·60–65·53)	67·29 (65·66–68·82)	59·53 (56·92–61·95)	74·68 (72·19–77·07)	64·43 (60·83–67·76)	68·40 (65·44–71·10)	60·50 (57·30–63·51)	16·40 (15·33–17·46)	12·25 (10·86–13·62)	13·64 (12·69–14·66)	10·39 (9·31–11·55)
Vanuatu	64·21 (59·00–69·19)	56·64 (51·85–61·42)	61·37 (56·42–66·39)	54·95 (50·36–59·62)	66·64 (61·23–70·86)	58·58 (53·61–62·91)	63·22 (58·12–67·35)	56·41 (51·72–60·55)	12·72 (10·52–14·57)	9·79 (7·92–11·44)	12·03 (10·43–13·29)	9·32 (7·90–10·69)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
North Africa and Middle East	72·55 (71·85–73·21)	62·33 (59·42–65·02)	68·64 (67·98–69·34)	59·98 (57·44–62·33)	74·94 (74·12–75·69)	64·29 (61·31–67·14)	70·07 (69·16–70·94)	61·16 (58·55–63·62)	17·58 (17·28–17·87)	13·07 (11·80–14·25)	15·37 (15·08–15·65)	11·55 (10·45–12·57)
Afghanistan	51·40 (47·39–55·64)	44·45 (40·62–48·10)	52·67 (48·93–56·74)	45·55 (42·13–49·21)	54·46 (50·19–58·82)	47·11 (43·28–51·24)	53·34 (49·22–57·70)	46·27 (42·42–50·19)	9·41 (8·21–10·93)	6·91 (5·82–8·22)	10·57 (9·49–12·37)	7·68 (6·52–9·09)
Algeria	76·07 (74·93–77·12)	65·55 (62·46–68·52)	73·51 (72·29–74·79)	64·39 (61·45–67·02)	77·44 (76·01–78·52)	66·66 (63·44–69·65)	75·37 (74·13–76·79)	65·91 (63·15–68·58)	18·29 (17·47–18·76)	13·73 (12·34–15·01)	17·48 (16·90–18·23)	13·26 (11·99–14·47)
Bahrain	78·06 (77·24–78·93)	66·10 (62·55–69·30)	74·63 (73·80–75·59)	64·92 (62·04–67·48)	80·34 (78·92–81·83)	67·98 (64·36–71·35)	78·21 (76·45–79·99)	67·89 (64·67–71·12)	19·23 (18·60–20·06)	14·00 (12·51–15·46)	17·76 (16·79–18·90)	13·22 (11·71–14·75)
Egypt	72·64 (72·38–72·87)	62·41 (59·38–65·08)	67·69 (67·45–67·94)	59·42 (57·08–61·59)	74·45 (73·88–74·95)	63·84 (60·71–66·58)	68·71 (68·13–69·28)	60·23 (57·62–62·46)	16·42 (16·23–16·61)	12·16 (10·97–13·28)	13·50 (13·34–13·66)	10·12 (9·16–11·03)
Iran	74·58 (72·51–76·50)	64·28 (61·12–67·51)	69·64 (67·24–71·98)	60·98 (57·86–64·21)	77·98 (75·87–80·02)	67·13 (63·56–70·62)	71·85 (69·18–74·18)	62·99 (59·82–66·40)	17·85 (16·78–19·04)	13·34 (11·86–14·92)	15·06 (14·08–16·17)	11·40 (10·11–12·80)
Iraq	68·24 (65·65–70·65)	58·57 (55·18–61·60)	63·26 (59·95–66·53)	54·71 (51·15–58·09)	70·66 (67·52–73·64)	60·53 (56·47–63·92)	64·33 (60·79–68·46)	55·65 (51·90–59·50)	14·80 (13·47–16·11)	10·88 (9·40–12·25)	13·05 (11·96–15·04)	9·55 (8·38–10·94)
Jordan	74·44 (73·52–75·33)	63·69 (60·58–66·46)	74·66 (73·91–75·44)	65·14 (62·30–67·75)	80·69 (79·65–81·78)	68·76 (65·18–72·06)	76·46 (75·09–77·61)	66·68 (63·79–69·52)	19·84 (19·18–20·58)	14·67 (13·09–16·13)	17·46 (16·64–18·17)	13·12 (11·76–14·44)
Kuwait	80·19 (79·91–80·52)	68·91 (65·71–71·77)	76·27 (75·99–76·54)	66·90 (64·25–69·36)	81·55 (80·47–82·71)	70·19 (66·81–73·29)	79·43 (77·94–80·67)	69·56 (66·56–72·40)	19·18 (18·38–20·06)	14·41 (12·88–15·84)	18·94 (18·09–19·69)	14·40 (12·97–15·80)
Lebanon	77·64 (75·78–79·42)	65·80 (62·25–69·26)	77·03 (74·16–79·60)	65·45 (61·58–69·00)	79·87 (77·76–82·32)	68·01 (64·42–71·62)	77·90 (75·08–80·86)	66·81 (62·93–70·47)	19·01 (18·09–20·31)	14·11 (12·60–15·68)	17·80 (16·14–19·72)	13·07 (11·28–15·01)
Libya	76·92 (76·07–77·62)	66·28 (63·11–69·04)	73·91 (73·06–74·78)	64·74 (61·95–67·21)	76·86 (75·26–78·22)	66·09 (62·84–69·25)	71·41 (68·93–73·78)	62·45 (59·39–65·54)	17·84 (16·99–18·55)	13·34 (11·96–14·72)	15·90 (14·76–16·92)	11·99 (10·61–13·33)
Morocco	73·80 (70·89–76·16)	63·24 (59·71–66·72)	71·62 (68·72–74·08)	61·88 (58·64–65·13)	75·83 (72·69–79·05)	64·92 (61·12–68·62)	73·32 (69·45–76·58)	63·37 (59·35–66·89)	17·20 (15·61–19·00)	12·70 (11·04–14·44)	16·39 (14·35–18·01)	12·13 (10·31–13·70)
Palestine	77·34 (76·55–78·10)	66·84 (63·82–69·70)	72·06 (70·51–73·06)	62·49 (59·81–65·14)	77·90 (75·78–79·78)	67·44 (63·98–70·52)	71·60 (68·64–74·52)	62·50 (59·06–65·67)	18·17 (17·04–19·22)	13·84 (12·39–15·21)	15·01 (13·92–16·52)	11·35 (9·94–12·77)
Oman	78·38 (77·34–79·32)	66·81 (63·47–69·91)	74·07 (72·92–75·18)	64·15 (61·29–66·85)	79·64 (78·29–81·14)	67·75 (64·31–71·05)	75·71 (74·05–77·69)	65·38 (62·24–68·65)	18·79 (18·11–19·71)	13·71 (12·25–15·17)	16·32 (15·48–17·55)	12·03 (10·70–13·57)
Qatar	78·31 (77·49–79·11)	67·01 (63·71–70·07)	75·24 (73·63–76·87)	65·43 (62·30–68·46)	81·20 (79·43–82·88)	69·31 (65·82–72·71)	79·11 (76·93–81·25)	68·57 (64·92–71·83)	19·76 (18·65–20·98)	14·58 (12·92–16·27)	18·59 (17·07–19·91)	13·80 (12·07–15·51)
Saudi Arabia	80·00 (79·43–80·55)	68·99 (65·85–71·89)	75·95 (75·29–76·58)	66·78 (64·09–69·25)	82·21 (81·29–83·09)	70·87 (67·53–74·08)	77·45 (76·34–78·53)	68·15 (65·33–70·73)	20·68 (19·98–21·46)	15·72 (14·25–17·18)	17·77 (16·98–18·51)	13·67 (12·41–14·90)
Sudan	66·07 (62·29–70·01)	56·47 (52·50–60·70)	63·09 (59·34–67·21)	54·72 (50·75–58·67)	69·27 (65·38–73·59)	59·38 (55·50–63·72)	65·81 (61·55–69·91)	57·16 (53·08–61·35)	15·03 (13·32–17·27)	11·20 (9·59–13·17)	14·27 (12·39–15·93)	10·56 (8·92–12·10)
Syria	77·37 (76·74–77·97)	67·20 (64·25–69·78)	73·85 (73·09–74·68)	65·31 (62·81–67·63)	74·81 (72·12–77·75)	63·82 (59·86–67·73)	62·58 (56·48–70·19)	54·17 (48·63–61·05)	17·98 (17·37–18·82)	13·46 (12·11–14·74)	15·47 (14·56–16·66)	11·74 (10·46–12·98)
Tunisia	78·95 (77·45–80·46)	68·16 (64·92–71·20)	73·66 (71·83–75·41)	64·38 (61·36–67·24)	80·73 (78·82–82·71)	69·61 (66·03–72·89)	74·63 (72·03–77·02)	65·26 (61·88–68·39)	19·77 (18·50–21·22)	14·95 (13·25–16·56)	16·18 (14·85–17·69)	12·24 (10·67–13·82)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Turkey	79·52 (78·90–80·10)	68·04 (64·90–70·99)	72·91 (72·25–73·57)	64·01 (61·39–66·35)	82·37 (81·82–82·94)	70·49 (66·94–73·59)	75·90 (75·25–76·55)	66·61 (63·86–69·04)	21·21 (20·91–21·55)	15·75 (14·19–17·16)	17·35 (16·89–17·67)	13·17 (11·92–14·27)
United Arab Emirates	77·32 (76·47–78·00)	66·22 (63·07–69·16)	74·16 (73·26–74·93)	64·47 (61·53–67·14)	78·02 (75·54–79·89)	67·00 (63·40–70·34)	74·52 (71·82–77·08)	65·04 (61·38–68·31)	17·99 (16·84–18·95)	13·46 (11·93–14·80)	15·92 (14·70–17·04)	11·98 (10·50–13·33)
Yemen	64·72 (59·58–70·44)	56·24 (51·57–61·26)	64·41 (59·19–69·89)	56·78 (52·15–61·46)	66·57 (60·83–71·63)	57·71 (52·65–62·10)	65·39 (59·70–70·23)	57·40 (52·34–61·68)	13·55 (11·14–16·14)	10·28 (8·32–12·21)	14·03 (11·65–16·29)	10·71 (8·75–12·50)
South Asia	65·22 (64·66–65·79)	55·61 (52·88–58·11)	62·43 (61·92–62·97)	54·26 (51·89–56·37)	69·56 (68·83–70·27)	59·52 (56·53–62·18)	65·42 (64·74–66·10)	57·15 (54·76–59·35)	15·10 (14·74–15·47)	11·19 (10·11–12·26)	13·39 (13·11–13·69)	10·04 (9·15–10·90)
Bangladesh	68·70 (67·58–69·89)	58·62 (55·71–61·43)	65·67 (64·60–66·76)	57·34 (54·71–59·68)	72·52 (70·56–74·46)	62·18 (58·79–65·30)	68·52 (66·50–70·35)	60·06 (57·26–62·74)	16·16 (14·93–17·32)	12·13 (10·66–13·46)	14·58 (13·76–15·33)	11·12 (10·01–12·19)
Bhutan	70·15 (67·77–72·32)	59·82 (56·53–63·05)	68·68 (66·42–70·67)	59·58 (56·50–62·30)	74·26 (71·54–76·54)	63·08 (59·42–66·49)	71·50 (69·05–74·20)	61·95 (58·52–65·20)	17·80 (16·35–19·13)	13·11 (11·52–14·60)	16·35 (15·06–17·75)	12·22 (10·73–13·75)
India	65·03 (64·41–65·66)	55·38 (52·60–57·89)	62·22 (61·65–62·83)	54·01 (51·64–56·15)	69·53 (68·68–70·43)	59·44 (56·46–62·17)	65·24 (64·46–66·00)	56·97 (54·53–59·20)	15·06 (14·65–15·51)	11·14 (10·03–12·17)	13·21 (12·89–13·53)	9·89 (9·00–10·75)
Nepal	68·83 (66·99–70·57)	59·54 (56·41–62·32)	65·96 (64·42–67·66)	57·63 (54·90–60·03)	71·23 (68·75–73·92)	61·58 (58·13–64·95)	68·09 (65·20–70·91)	59·53 (56·39–62·74)	15·56 (14·22–17·16)	11·81 (10·30–13·35)	14·76 (13·48–16·01)	11·25 (9·97–12·59)
Pakistan	63·24 (61·42–65·05)	54·31 (51·48–57·18)	61·29 (59·54–63·19)	53·51 (50·86–55·94)	67·32 (65·22–69·82)	57·93 (54·76–61·01)	64·54 (62·22–66·49)	56·40 (53·59–59·28)	14·39 (13·34–15·78)	10·73 (9·41–12·06)	13·59 (12·72–14·32)	10·21 (9·14–11·34)
Sub-Saharan Africa	55·92 (55·05–56·74)	47·94 (45·32–50·16)	54·26 (53·46–55·10)	47·13 (44·90–49·12)	63·61 (61·83–65·17)	54·63 (51·52–57·44)	60·02 (58·35–61·58)	52·35 (49·72–54·90)	14·28 (13·44–15·06)	10·57 (9·31–11·69)	13·33 (12·62–13·99)	9·96 (8·86–10·99)
Southern sub-Saharan Africa	51·80 (50·49–53·23)	44·71 (42·42–46·86)	49·85 (48·74–51·12)	43·62 (41·66–45·44)	63·21 (61·67–64·69)	54·06 (51·28–56·71)	57·51 (56·00–58·95)	50·14 (47·75–52·40)	14·81 (14·01–15·56)	10·80 (9·59–11·98)	12·35 (11·68–13·03)	9·05 (8·05–9·98)
Botswana	50·78 (39·38–64·33)	44·97 (34·78–54·50)	47·92 (38·74–60·22)	42·81 (34·01–51·74)	62·01 (47·70–72·30)	53·95 (41·57–61·73)	55·78 (43·89–66·62)	49·39 (39·01–57·39)	13·82 (7·51–18·54)	10·57 (5·57–13·91)	12·01 (7·31–16·37)	9·10 (5·40–12·22)
Lesotho	44·77 (41·20–48·58)	38·92 (35·56–42·30)	41·21 (38·65–44·59)	36·45 (34·07–39·63)	50·41 (43·61–58·50)	43·83 (37·87–49·81)	44·11 (38·61–51·77)	39·13 (34·27–44·74)	11·49 (8·12–15·20)	8·57 (5·97–11·17)	9·26 (7·16–12·77)	6·87 (5·22–9·42)
Namibia	55·05 (51·33–59·06)	47·65 (43·90–51·40)	51·07 (48·07–54·29)	44·91 (41·85–48·01)	68·44 (61·62–73·04)	58·70 (52·80–63·47)	59·98 (53·61–66·28)	52·56 (46·87–58·13)	16·51 (12·83–18·64)	12·31 (9·39–14·52)	13·01 (10·40–15·97)	9·79 (7·69–12·19)
South Africa	53·62 (52·18–55·38)	46·19 (43·83–48·49)	51·67 (50·36–53·14)	45·17 (43·09–47·15)	63·99 (62·55–65·18)	54·63 (51·81–57·23)	58·64 (57·32–59·91)	51·07 (48·74–53·20)	14·97 (14·18–15·69)	10·88 (9·65–12·06)	12·56 (11·93–13·21)	9·15 (8·16–10·12)
Swaziland	43·17 (39·24–47·45)	37·24 (33·86–40·73)	41·68 (38·42–45·84)	36·52 (33·44–39·83)	54·87 (46·71–63·97)	47·12 (40·22–53·87)	48·96 (42·27–58·26)	43·01 (37·10–49·82)	12·24 (8·24–16·65)	9·06 (5·84–12·09)	10·36 (7·55–14·68)	7·68 (5·39–10·79)
Zimbabwe	45·56 (42·36–49·34)	39·75 (36·90–42·77)	44·61 (41·95–48·39)	39·24 (36·79–42·17)	62·54 (56·27–68·35)	54·29 (48·68–59·44)	56·28 (51·09–62·63)	49·52 (44·79–54·76)	14·81 (11·38–18·26)	11·23 (8·38–13·90)	12·20 (10·09–15·22)	9·24 (7·37–11·68)
Western sub-Saharan Africa	57·51 (56·07–58·82)	49·35 (46·72–51·71)	55·80 (54·46–57·19)	48·44 (46·03–50·65)	64·15 (60·80–66·47)	55·25 (51·81–58·49)	60·97 (58·24–62·97)	53·19 (50·17–55·91)	14·98 (13·35–16·06)	11·21 (9·74–12·54)	14·16 (13·01–15·00)	10·62 (9·32–11·78)
Benin	60·97 (56·43–65·32)	52·53 (48·15–56·53)	56·21 (52·01–61·29)	49·70 (45·45–53·99)	64·84 (55·71–72·41)	56·44 (49·10–62·89)	59·88 (51·34–68·32)	53·59 (45·88–60·42)	13·93 (10·08–17·93)	10·67 (7·51–13·80)	12·40 (9·47–15·93)	9·66 (7·11–12·34)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Burkina Faso	56·63 (53·42–59·73)	48·94 (45·56–52·15)	55·04 (52·19–58·27)	48·19 (44·89–51·56)	61·85 (54·32–68·96)	54·25 (47·62–60·31)	60·01 (52·54–66·03)	53·28 (47·34–58·69)	13·59 (10·13–17·19)	10·51 (7·72–13·28)	13·54 (10·32–16·35)	10·47 (7·98–12·83)
Cameroon	55·92 (52·80–59·52)	48·21 (44·66–51·56)	53·84 (50·74–57·25)	46·89 (43·74–50·19)	61·20 (53·95–68·55)	53·35 (46·88–59·61)	57·59 (50·44–64·22)	50·85 (44·49–56·32)	14·06 (10·39–17·58)	10·68 (7·68–13·40)	12·99 (9·83–16·07)	9·86 (7·25–12·30)
Cape Verde	76·02 (73·41–76·91)	65·63 (62·25–68·60)	63·22 (59·21–68·01)	56·01 (52·27–60·21)	76·55 (74·33–77·59)	66·26 (62·96–69·24)	69·13 (66·18–71·78)	60·99 (57·64–64·19)	18·09 (16·79–18·64)	13·68 (12·17–15·01)	14·85 (13·40–16·22)	11·31 (9·78–12·82)
Chad	54·49 (49·28–60·02)	47·07 (42·17–51·79)	51·52 (46·42–57·50)	44·78 (40·30–49·49)	58·88 (49·37–67·61)	51·31 (43·16–58·31)	55·92 (47·52–63·60)	48·99 (41·63–55·16)	13·57 (9·15–18·17)	10·39 (6·83–13·74)	12·82 (9·30–16·41)	9·68 (6·76–12·31)
Côte d'Ivoire	54·81 (51·77–58·19)	47·31 (44·08–50·42)	52·17 (49·40–55·26)	45·74 (42·79–48·69)	61·41 (55·01–68·52)	53·25 (47·55–58·86)	57·21 (49·99–64·50)	50·62 (44·57–56·49)	13·45 (10·36–17·14)	10·18 (7·63–12·89)	12·52 (9·58–15·76)	9·58 (7·19–12·09)
The Gambia	66·15 (63·52–69·30)	57·47 (53·89–60·95)	63·77 (60·62–66·93)	56·24 (53·02–59·47)	69·63 (64·33–74·55)	60·60 (55·53–65·49)	66·65 (61·40–70·72)	58·85 (53·84–63·05)	15·20 (12·74–17·85)	11·66 (9·40–13·93)	14·44 (12·06–16·15)	11·12 (9·08–12·84)
Ghana	62·22 (58·39–66·35)	54·17 (50·38–58·28)	59·44 (55·06–63·57)	52·58 (48·64–56·59)	67·55 (59·65–74·25)	59·26 (52·16–65·27)	63·06 (54·99–69·81)	56·43 (49·27–62·23)	14·65 (11·01–18·42)	11·43 (8·29–14·33)	13·26 (10·33–16·14)	10·37 (7·79–12·80)
Guinea	56·87 (54·19–59·83)	49·13 (46·04–52·16)	55·17 (52·35–58·20)	48·39 (45·37–51·39)	60·49 (54·52–67·09)	52·65 (47·07–58·36)	57·81 (50·80–64·49)	51·10 (45·32–56·48)	13·11 (10·29–16·46)	10·04 (7·59–12·67)	12·74 (9·77–15·74)	9·76 (7·38–12·08)
Guinea-Bissau	53·45 (41·87–65·17)	47·62 (37·00–56·49)	52·32 (41·45–61·55)	46·95 (36·92–54·28)	56·44 (42·35–67·69)	50·29 (37·66–58·94)	54·86 (41·87–63·97)	49·30 (37·55–56·40)	12·49 (7·38–18·14)	9·86 (5·56–13·75)	12·60 (7·97–16·67)	9·81 (6·01–12·82)
Liberia	58·41 (55·78–61·50)	49·34 (45·91–52·69)	58·42 (55·80–61·11)	49·59 (46·21–52·76)	63·41 (57·41–69·44)	54·28 (49·06–59·54)	63·08 (57·54–67·67)	54·32 (49·25–58·93)	13·46 (10·70–16·61)	9·89 (7·64–12·38)	14·11 (11·59–16·32)	10·32 (8·27–12·33)
Mali	57·10 (54·19–59·62)	48·99 (45·63–52·25)	56·70 (54·17–59·25)	49·03 (45·80–51·97)	60·44 (54·41–66·68)	52·48 (46·95–57·55)	60·04 (54·18–64·35)	52·64 (47·53–56·71)	13·86 (10·84–16·93)	10·51 (8·06–12·88)	14·63 (12·17–16·71)	11·06 (8·94–12·93)
Mauritania	66·08 (63·12–68·95)	56·59 (53·00–60·00)	66·76 (63·89–69·70)	57·74 (54·26–60·96)	69·81 (63·59–75·57)	60·13 (54·58–65·16)	69·83 (63·66–75·84)	60·72 (55·13–65·85)	15·43 (12·47–18·74)	11·57 (9·08–13·97)	16·23 (13·54–19·71)	12·20 (9·82–14·85)
Niger	56·69 (53·93–59·39)	49·23 (46·04–52·19)	55·23 (52·52–57·72)	48·42 (45·56–51·12)	62·47 (56·63–68·18)	54·62 (49·53–59·73)	59·58 (52·81–65·38)	52·71 (46·88–57·41)	14·18 (11·30–17·09)	10·82 (8·50–13·07)	13·37 (10·41–15·90)	10·20 (7·88–12·23)
Nigeria	57·27 (54·37–59·89)	48·85 (45·55–51·94)	56·32 (53·71–59·05)	48·49 (45·46–51·58)	66·33 (59·47–70·32)	56·70 (51·20–61·03)	62·95 (57·35–65·78)	54·38 (49·69–57·95)	16·69 (13·14–18·76)	12·42 (9·77–14·48)	15·56 (13·16–16·63)	11·54 (9·51–13·09)
São Tomé and Príncipe	66·23 (62·95–69·55)	57·52 (53·96–60·98)	64·70 (61·02–68·11)	56·82 (53·12–60·37)	68·81 (61·31–75·85)	59·88 (53·33–66·12)	67·19 (59·36–74·84)	59·20 (52·56–65·53)	14·08 (10·84–17·67)	10·72 (8·12–13·39)	14·05 (11·23–17·55)	10·75 (8·30–13·43)
Senegal	63·34 (58·73–68·24)	54·93 (50·49–59·50)	60·96 (55·78–65·54)	53·85 (49·19–57·99)	66·70 (58·22–74·46)	58·42 (50·73–64·76)	63·84 (54·36–70·63)	56·97 (48·79–63·01)	13·78 (10·12–17·89)	10·62 (7·54–13·61)	13·27 (9·98–16·37)	10·37 (7·55–12·81)
Sierra Leone	53·25 (51·13–55·51)	45·84 (43·07–48·53)	51·31 (49·15–53·49)	44·43 (41·65–46·90)	57·73 (51·98–63·30)	50·57 (45·66–55·39)	56·54 (50·98–62·48)	49·86 (44·73–54·86)	12·49 (9·78–15·38)	9·48 (7·31–11·79)	12·90 (10·28–15·60)	9·74 (7·58–11·87)
Togo	59·02 (55·78–62·50)	51·21 (47·63–54·69)	54·59 (51·23–58·28)	48·11 (44·83–51·43)	64·61 (58·52–70·49)	56·48 (50·97–61·52)	58·47 (52·25–65·69)	52·02 (46·39–57·51)	14·56 (11·46–17·65)	11·20 (8·60–13·65)	12·32 (9·91–15·47)	9·53 (7·35–11·85)
Eastern sub-Saharan Africa	56·08 (54·83–57·34)	48·45 (45·86–50·76)	54·53 (53·31–55·72)	47·61 (45·40–49·71)	64·32 (61·38–67·07)	55·84 (52·48–58·99)	60·50 (57·72–63·16)	53·13 (50·12–56·22)	13·98 (12·61–15·37)	10·53 (9·15–11·90)	13·06 (11·85–14·21)	9·88 (8·61–11·14)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Burundi	55·27 (52·28–58·06)	48·44 (45·16–51·56)	54·16 (50·88–57·52)	47·83 (44·43–51·02)	62·69 (54·73–70·23)	55·80 (48·75–62·27)	60·10 (53·06–67·68)	53·82 (47·80–59·82)	12·82 (9·59–16·50)	10·08 (7·37–12·88)	12·63 (9·89–15·75)	9·88 (7·68–12·18)
Comoros	66·70 (63·68–69·99)	57·99 (54·66–61·50)	65·33 (62·26–68·60)	57·09 (53·78–60·39)	69·29 (63·40–75·47)	60·62 (54·98–65·59)	66·88 (59·97–73·41)	58·93 (52·88–64·41)	14·53 (11·92–17·65)	11·10 (8·78–13·54)	14·20 (11·45–17·21)	10·82 (8·68–13·10)
Djibouti	63·91 (53·86–71·72)	55·49 (47·06–61·84)	57·84 (47·80–66·54)	51·35 (42·10–58·41)	66·98 (56·90–74·05)	58·00 (50·10–64·10)	60·88 (50·23–69·17)	53·93 (44·93–60·78)	14·82 (10·34–18·71)	11·17 (7·77–13·99)	12·68 (9·03–16·33)	9·67 (6·85–12·37)
Eritrea	60·25 (51·43–69·82)	52·69 (45·09–59·93)	59·80 (49·75–67·61)	52·23 (44·29–58·27)	61·27 (51·78–71·86)	54·02 (45·38–61·97)	60·30 (50·84–69·23)	53·13 (44·87–60·06)	11·72 (8·22–16·59)	9·11 (6·24–12·36)	12·28 (9·13–15·98)	9·37 (6·69–12·12)
Ethiopia	56·14 (53·45–58·72)	49·32 (46·48–52·07)	56·04 (53·51–58·96)	49·30 (46·65–52·30)	66·80 (59·33–73·42)	58·77 (52·50–64·20)	63·57 (55·62–69·63)	56·28 (49·52–61·63)	14·27 (10·72–17·84)	11·00 (8·27–13·63)	13·56 (10·54–16·34)	10·42 (7·90–12·58)
Kenya	58·53 (57·14–59·88)	49·67 (46·13–52·44)	55·96 (54·64–57·25)	48·76 (46·34–50·93)	67·57 (65·77–69·31)	57·66 (53·64–61·01)	62·82 (61·09–64·62)	54·92 (52·29–57·47)	15·31 (14·17–16·53)	11·45 (9·89–12·97)	13·87 (13·01–14·77)	10·59 (9·37–11·68)
Madagascar	62·33 (59·40–65·25)	53·64 (50·13–57·00)	60·13 (56·80–62·98)	52·03 (48·41–55·18)	65·04 (57·77–72·35)	56·75 (50·52–62·59)	61·91 (54·45–69·95)	54·43 (48·02–60·83)	13·15 (10·10–16·69)	9·99 (7·55–12·60)	12·64 (9·95–15·97)	9·56 (7·46–11·87)
Malawi	49·32 (46·27–52·66)	42·60 (39·74–45·60)	47·72 (44·73–51·41)	41·63 (38·71–44·92)	62·98 (56·85–68·70)	54·97 (49·46–59·86)	58·15 (51·92–63·72)	51·35 (46·05–56·40)	14·81 (11·53–17·83)	11·32 (8·60–13·68)	13·51 (10·59–16·30)	10·37 (7·97–12·57)
Mozambique	54·79 (51·04–58·72)	46·48 (42·43–50·10)	50·88 (47·90–54·71)	44·16 (41·06–47·64)	59·86 (52·11–67·28)	51·69 (45·15–57·69)	54·28 (47·35–61·94)	47·80 (41·60–53·86)	13·85 (9·99–17·92)	10·32 (7·24–13·27)	11·87 (9·20–15·65)	8·84 (6·56–11·72)
Rwanda	60·97 (58·02–64·00)	52·57 (48·95–56·16)	58·08 (55·32–61·18)	50·39 (47·21–53·62)	67·68 (60·39–73·73)	59·11 (52·82–64·58)	63·73 (56·40–69·34)	56·16 (49·82–61·32)	15·06 (11·69–18·23)	11·56 (8·91–14·25)	13·95 (10·78–16·52)	10·74 (8·17–12·89)
Somalia	52·51 (41·10–66·66)	45·86 (35·54–55·66)	51·66 (41·01–63·08)	46·33 (36·49–54·83)	54·98 (42·35–67·96)	47·96 (37·04–57·19)	53·40 (41·87–64·12)	47·76 (37·41–55·73)	10·69 (7·12–16·09)	8·10 (5·21–11·73)	11·26 (7·63–15·67)	8·71 (5·75–11·88)
South Sudan	55·74 (43·07–67·56)	48·44 (37·79–57·07)	54·87 (43·09–64·34)	47·89 (37·96–55·43)	56·87 (43·88–68·72)	49·77 (38·27–58·38)	55·45 (43·16–64·87)	48·64 (38·05–56·08)	11·97 (7·37–17·66)	8·98 (5·34–13·00)	12·33 (7·95–16·51)	9·12 (5·83–12·18)
Tanzania	57·17 (53·50–60·79)	49·44 (46·06–53·05)	57·12 (53·46–60·80)	49·74 (46·17–53·19)	65·47 (56·90–72·65)	57·40 (50·02–63·49)	62·69 (54·76–68·51)	55·32 (48·37–60·49)	14·46 (10·45–18·66)	11·18 (7·94–14·12)	13·93 (10·64–16·46)	10·71 (8·00–12·82)
Uganda	55·34 (52·66–58·44)	47·78 (44·69–50·97)	51·71 (49·09–54·57)	45·36 (42·49–48·23)	64·35 (56·89–71·57)	56·25 (49·89–62·36)	58·36 (51·27–66·03)	51·76 (45·44–57·69)	14·11 (10·60–18·08)	10·90 (7·98–13·80)	12·40 (9·73–15·74)	9·54 (7·25–12·13)
Zambia	48·46 (45·68–51·26)	42·41 (39·54–45·15)	45·78 (43·60–48·33)	40·36 (37·94–42·72)	59·83 (53·63–67·00)	52·38 (46·92–58·21)	53·97 (48·48–61·10)	47·77 (42·64–53·66)	12·74 (9·89–16·41)	9·81 (7·34–12·57)	10·61 (8·78–13·49)	8·07 (6·51–10·38)
Central sub-Saharan Africa	56·41 (52·60–59·67)	46·71 (41·51–50·81)	54·60 (51·21–57·42)	46·50 (42·70–49·68)	61·04 (55·98–66·25)	50·71 (44·61–55·69)	58·94 (53·90–63·87)	50·56 (46·12–54·91)	12·79 (10·79–15·11)	8·87 (6·84–10·89)	12·61 (10·67–14·58)	9·12 (7·53–10·85)
Angola	55·19 (43·52–67·89)	47·66 (37·79–56·61)	55·20 (44·08–64·69)	48·52 (38·95–56·00)	59·75 (45·75–71·66)	51·73 (39·66–60·53)	59·55 (46·05–68·63)	52·43 (41·43–59·55)	12·10 (7·38–17·92)	8·97 (5·42–12·88)	12·72 (8·13–16·57)	9·57 (6·13–12·44)
Central African Republic	47·63 (39·73–57·62)	41·10 (34·21–48·26)	43·62 (37·13–52·61)	38·33 (32·47–45·21)	51·75 (42·48–63·18)	45·12 (37·16–53·72)	47·55 (39·54–59·15)	42·15 (34·69–50·66)	10·90 (7·53–16·52)	8·25 (5·45–12·08)	9·75 (7·41–14·86)	7·34 (5·32–10·57)
Congo	55·61 (52·62–58·83)	47·40 (43·62–50·61)	58·08 (54·72–61·61)	50·39 (46·85–54·00)	60·01 (52·72–68·01)	51·32 (45·16–57·62)	63·40 (55·94–68·74)	55·23 (48·88–60·46)	11·54 (8·70–15·25)	8·42 (6·22–11·06)	14·00 (11·01–16·37)	10·51 (8·10–12·58)

(Table 2 continues on next page)

	2005, at birth				2015, at birth				2015, at age 65 years			
	Females		Males		Females		Males		Females		Males	
	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE	Life expectancy	HALE
(Continued from previous page)												
Democratic Republic of the Congo	57·64 (55·14–60·61)	47·07 (40·13–51·19)	55·25 (52·58–57·86)	46·61 (42·75–49·94)	62·14 (56·77–68·11)	51·04 (43·96–56·67)	59·37 (53·21–65·66)	50·66 (45·33–55·99)	13·20 (10·70–16·25)	9·04 (6·57–11·48)	12·70 (10·21–15·37)	9·14 (7·12–11·15)
Equatorial Guinea	56·51 (44·74–67·67)	49·44 (38·84–57·56)	55·55 (44·50–63·43)	48·93 (39·34–55·10)	61·90 (48·89–71·63)	53·99 (42·57–61·32)	60·27 (48·44–67·38)	53·03 (42·56–58·90)	13·77 (8·32–18·74)	10·47 (6·04–13·86)	13·88 (9·07–16·60)	10·47 (6·73–12·86)
Gabon	61·28 (58·52–64·16)	51·68 (47·81–55·07)	59·26 (55·55–63·45)	51·16 (47·61–55·01)	68·45 (61·48–74·32)	57·02 (50·37–62·57)	63·58 (56·80–69·02)	55·00 (48·91–60·04)	14·41 (11·30–17·40)	10·16 (7·60–12·55)	13·98 (11·11–16·34)	10·34 (8·00–12·41)

Data in parentheses are 95% uncertainty intervals. HALE=healthy life expectancy. SDI=Socio-demographic Index.

Table 2: **Global, regional, and national or territory life expectancy and HALE at birth, by sex, in 2005 and 2015, and HALE at age 65, by sex, in 2015**

For people 60 years and older, several causes, including ischaemic heart disease, chronic kidney disease, diabetes, hearing loss, and Alzheimer's disease and other dementias, ranked among the leading causes of DALYs in 2015 and caused more DALYs than in 2005.

Regional and country-specific HALE

HALE at birth was highest for men in Singapore (72·3 years [95% UI 70·1–74·2]) and for women in Andorra (76·3 years [72·8–79·4]) in 2015. It was lowest in Lesotho for both men (39·1 years [34·3–44·7]) and women (43·8 years [37·9–49·8]; table 2; appendix p 12). HALE at birth in 2015 exceeded 70 years in only 14 geographies for men, while 59 countries and territories surpassed this threshold for women. 13 countries and territories had HALE lower than 50 years for either sex. Since 2005, 121 countries and territories had significant increases in HALE at birth for men and 139 for women, led in both cases by Zimbabwe, whereas HALE at birth worsened for two countries (Syria and Libya) driven mainly by decreases in life expectancy (table 2). HALE at age 65 years was highest in Andorra for both men (15·2 years [UI 13·9–16·3]) and women (19·4 years [17·8–20·8]) in 2015, whereas the lowest HALE for men was in Lesotho (6·9 years [5·2–9·4]) and for women in Afghanistan (6·9 years [5·8–8·2]).

Epidemiological transition

HALE at birth increased continuously and in a largely linear manner with increasing SDI for both sexes (figure 4A). At a SDI of 0·20, average HALE was 46·2 years for men and 47·1 years for women; by a SDI of 0·90, average HALE was 69·8 years for men and 73·8 years for women. Among high SDI regions, North America was the furthest below expected HALE at birth for both sexes, whereas high-income Asia Pacific remained above expected HALE at birth for both sexes and over time. In Australasia, male HALE was consistently close to expected levels, whereas female HALE remained below expected levels since 1990. With the exception of the Caribbean in 2010 (the year of the Haitian earthquake) HALE at birth throughout Latin America and the Caribbean was generally higher than expected for both sexes. HALE at birth also exceeded expectations in east Asia and north Africa and the Middle East. By contrast, Oceania steadily remained below expected levels of HALE, and all regions within the central Europe, eastern Europe, and central Asia GBD super-region had HALE lower than expected over time, particularly for men. HALE trends in sub-Saharan Africa were heavily influenced by the HIV/AIDS epidemic, particularly in southern sub-Saharan Africa, where HALE was well below expected levels. Notably, after lagging below expected levels of HALE before 2005, eastern sub-Saharan Africa posted average HALE for women that exceeded expected levels. Less pronounced increases occurred for men in eastern sub-Saharan Africa, as HALE essentially equalled expected levels only around 2010 (figure 4A).

Years of functional health lost on average increased as countries developed (figure 4B). Among high-income regions, all regions except for high-income Asia Pacific consistently exceeded expected levels of functional health loss over time, and women generally experienced a higher gap than men. South Asia, north Africa and the Middle East, and central sub-Saharan Africa had generally higher-than-expected functional health loss, whereas a number of regions, including Oceania, southeast Asia, and east Asia, all recorded smaller gaps between life expectancy and HALE than was expected.

The ratio of years of functional health loss to life expectancy, the proportion of life expectancy spent with disability, declined slightly with increasing SDI (figure 4C). Among men and women, central sub-Saharan Africa had the highest proportion of life spent with disability in 2015, although high-income North America had the largest difference between observed and expected levels for that year. For both sexes, several regions showed higher-than-expected proportions of life expectancy spent in ill health (eg, south Asia, north Africa and the Middle East, and

Figure 2: **Leading 30 Level 3 causes of global DALYs for both sexes combined, 1990, 2005, 2015, with percentage change in number of DALYs, and all-age, and age-standardised rates**
Causes are connected by lines between time periods; solid lines are increases and dashed lines are decreases. For the time period of 1990 to 2005 and for 2005 to 2015, three measures of change are shown: percent change in the number of DALYs, percent change in the all-age DALY rate, and percent change in the age-standardised DALY rate. Statistically significant changes are shown in bold. DALYs=disability-adjusted life-years. COPD=chronic obstructive pulmonary disease.

Australasia), whereas others experienced lower-than-expected levels over time (eg, southeast Asia, east Asia, eastern sub-Saharan Africa, and southern Latin America).

Expected age-standardised YLL rates for many communicable causes and neonatal conditions declined profoundly as SDI increased (figure 5A). At the same time, age-standardised YLD rates for the leading causes of YLDs such as mental and substance abuse disorders and musculoskeletal disorders demonstrate relatively little change. At higher SDIs, the composition of disease burden shifted toward YLDs as the primary driver of burden, mainly due to the differential pace of change. The combined effect of the change in age-specific rates and age-structure change that occur with development is shown in figure 5B, which provides expected all-age YLL and YLD rates for Level 2 causes. Demographic shifts in age-structure potentiate and accelerate the transition from Group 1 conditions toward NCDs in terms of the composition of the burden of disease that health systems must handle. Of note, from an SDI of 0·8 onwards further declines in the age-standardised rates are matched or exceeded by increases in population age structure so that all-age rates for YLDs actually increase, as do YLL rates for some causes such as neurological conditions. These characterisations of the epidemiological transition demonstrate the double burden of communicable diseases and NCDs for populations with an SDI in the intermediate range.

Observed versus expected total and cause-specific burden

In 2015, the Maldives and Nicaragua had the lowest ratios of observed to expected all-ages DALY rates; many countries throughout Latin America also had lower-than-expected all-ages DALY rates (figure 6). Other regions where observed all-ages DALY rates fell below expected levels, included western Europe (eg, Portugal, Spain, France, Italy, and Sweden); western sub-Saharan Africa (eg, Burkina Faso,

	1	2	3	4	5	6	7	8	9	10
Early neonatal (0–6 days)	NN Preterm	NN Enceph	NN Sepsis	Congenital	Other NN	LRI	NN Haemol	STD	Diarrhoea	Meningitis
Late neonatal (7–27 days)	NN Sepsis	NN Preterm	NN Enceph	Congenital	LRI	Other NN	Diarrhoea	Meningitis	Malaria	NN Haemol
Post-neonatal (28–364 days)	LRI	Diarrhoea	Congenital	Malaria	PEM	Meningitis	HIV	Haemog	Iron	NN Preterm
1–4 years	Malaria	Diarrhoea	LRI	PEM	Iron	Congenital	Meningitis	Drowning	Skin	Haemog
5–9 years	Iron	Skin	LRI	Diarrhoea	Intest inf	Malaria	HIV	Asthma	Road injuries	Congenital
10–14 years	Iron	Skin	HIV	Conduct	Asthma	Road injuries	Anxiety	Intest inf	Migraine	Haemog
15–19 years	Road injuries	Skin	Depression	Iron	Back & neck	Self-harm	Migraine	Anxiety	Violence	HIV
20–24 years	Road injuries	Depression	Self-harm	Back & neck	Skin	Violence	HIV	Migraine	Iron	Other MSK
25–29 years	Road injuries	HIV	Back & neck	Depression	Self-harm	Migraine	Skin	Violence	TB	Drugs
30–34 years	HIV	Back & neck	Road injuries	Depression	Self-harm	Migraine	IHD	TB	Skin	Violence
35–39 years	HIV	Back & neck	Road injuries	Depression	IHD	Migraine	TB	Self-harm	Stroke	Other MSK
40–44 years	Back & neck	HIV	IHD	Road injuries	Depression	Stroke	Diabetes	Sense	TB	Migraine
45–49 years	IHD	Back & neck	Stroke	Diabetes	HIV	Depression	Road injuries	Sense	TB	Other MSK
50–54 years	IHD	Stroke	Back & neck	Diabetes	Sense	Depression	Lung C	COPD	Road injuries	TB
55–59 years	IHD	Stroke	Back & neck	Diabetes	Sense	COPD	Lung C	Depression	TB	CKD
60–64 years	IHD	Stroke	Diabetes	Back & neck	COPD	Sense	Lung C	CKD	LRI	Depression
65–69 years	IHD	Stroke	COPD	Diabetes	Sense	Back & neck	Lung C	CKD	LRI	Stomach C
70–74 years	IHD	Stroke	COPD	Sense	Diabetes	Back & neck	Lung C	LRI	Alzheimer's	CKD
75–79 years	IHD	Stroke	COPD	Sense	Diabetes	Alzheimer's	Back & neck	LRI	Lung C	CKD
≥80 years	IHD	Stroke	Alzheimer's	COPD	Sense	LRI	Diabetes	CKD	Back & neck	HTN HD

Rate of change 2005–15 (%)

−0·56 to −0·31 | −0·31 to −0·19 | −0·19 to −0·09 | −0·09 to −0·04 | −0·04 to 0·01 | 0·01 to 0·08 | 0·08 to 0·15 | 0·15 to 0·23 | 0·23 to 0·32 | 0·32 to 0·57

Figure 3: **Leading ten Level 3 causes of global age-specific DALYs in 2015**

Each cause is coloured by the percentage change in age-specific DALYs from 2005 to 2015. NN Preterm=neonatal preterm birth complications. NN Sepsis=neonatal sepsis and other neonatal infections. LRI=lower respiratory infections. Iron=iron-deficiency anaemia. HIV=HIV/AIDS. Back & neck=low back and neck pain. IHD=ischaemic heart disease. NN Enceph=neonatal encephalopathy due to birth asphyxia and trauma. Diarrhoea=diarrhoeal diseases. Skin=skin and subcutaneous diseases. Depression=depressive disorders. Stroke=cerebrovascular disease. Congenital=congenital anomalies. Diabetes=diabetes mellitus. COPD=chronic obstructive pulmonary disease. Alzheimer's=Alzheimer's disease and other dementias. PEM=protein-energy malnutrition. Conduct=conduct disorder. Sense=sense organ diseases. Other NN=other neonatal disorders. Intest inf=intestinal infectious diseases. Violence=interpersonal violence. NN Haemol=haemolytic disease and other neonatal jaundice. Anxiety=anxiety disorders. TB=tuberculosis. Lung C= lung, bronchial, and tracheal cancers. STD=sexually transmitted diseases excluding HIV. Haemog=haemoglobinopathies and haemolytic anaemias. CKD=chronic kidney disease. Other MSK=other musculoskeletal disorders. Drugs=drug use disorders. Stomach C=stomach cancer. HTN HD=hypertensive heart disease. GBD=Global Burden of Disease. DALYs=disability-adjusted life-years.

Niger, and Senegal); eastern sub-Saharan Africa (eg, Burundi and Ethiopia); north Africa and the Middle East (eg, Jordan, Saudi Arabia, and Turkey); east Asia (eg, China); and a subset of countries in South and Southeast Asia (eg, Bangladesh, Sri Lanka, and Vietnam). By contrast, observed all-ages DALY rates exceeded expected levels in southern sub-Saharan Africa, much of central Asia and eastern Europe, and a number of countries in central sub-Saharan Africa. Notably, observed all-ages DALY rates surpassed expected levels in the USA.

Ischaemic heart disease and stroke were the leading two causes of DALYs worldwide in 2015, and 106 geographies also had one of these diseases as the leading cause of DALYs that year (figure 7). Four GBD super-regions showed deviations from this trend: Latin America and the Caribbean, where diabetes and interpersonal violence often resulted in the most DALYs; north Africa and the Middle East, where war was a primary cause of burden; south Asia, where neonatal disorders often ranked among the leading causes of DALYs; and sub-Saharan Africa, where HIV/AIDS or malaria was the leading driver of disease burden in 29 geographies.

Stroke resulted in the most countries (94) having lower observed DALYs than expected based on their SDI. Other leading causes for which observed DALYs were well below expected levels included ischaemic heart disease particularly in Latin America, east Asia, and southeast Asia; road injuries in north Africa and the Middle East; and lower respiratory infections and diarrhoeal diseases in sub-Saharan Africa. Many high-income countries and territories also had lower-than-expected DALYs from ischaemic heart disease and Alzheimer's disease and other dementias. Road injuries accounted for lower burden than expected in 52 countries and territories, especially in Colombia. Although many Group 1 causes remained among the leading causes of DALYs, observed levels were often lower than expected on the basis of SDI (eg, lower respiratory infections in Ethiopia, diarrhoeal diseases in Afghanistan, and preterm birth complications in Kenya).

By contrast, diabetes was a leading cause for which observed burden exceeded expected levels in many geographies, especially in Oceania and the Caribbean. Observed DALYs due to chronic obstructive pulmonary disease were higher than expected in 30 geographies, as were those due to liver cancer and lung cancer for a subset of countries and territories. Drug use disorders led to more observed DALYs than expected in many high-income countries in 2015, particularly in the USA and Australia. A similar pattern occurred for self-harm, cirrhosis, alcohol use disorders, and drug use disorders throughout eastern Europe, and most prominently in Russia. Interpersonal violence was among the leading two causes of DALYs for six of 11 countries in central and tropical Latin America (Brazil, Colombia, El Salvador, Guatemala, Honduras, and

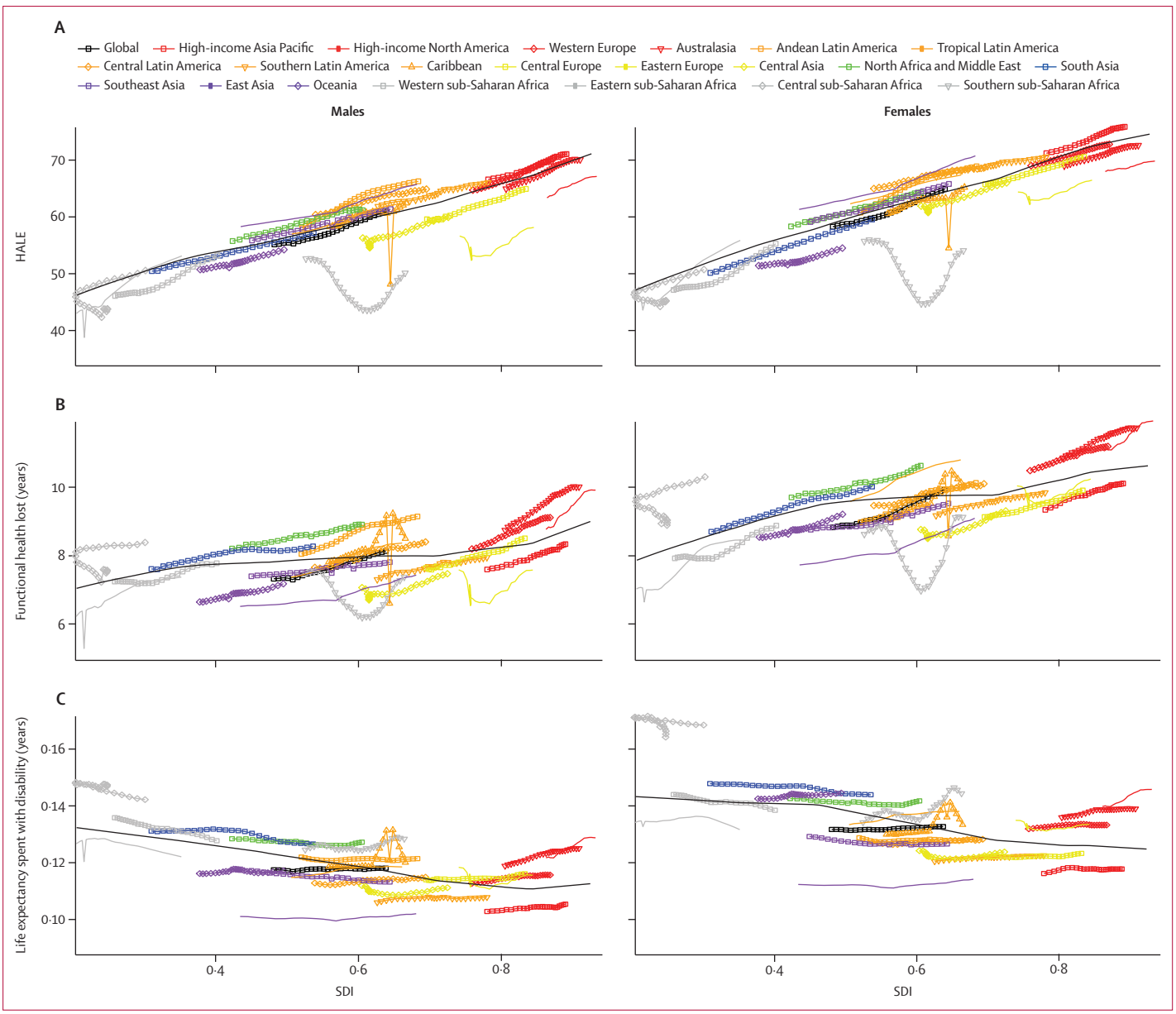

***Figure 4*: Co-evolution of HALE (A), functional health lost (life expectancy minus HALE; B), and life expectancy spent with disability (life expectancy minus HALE, divided by HALE; C) with SDI globally and for GBD regions, 1990 to 2015**

Coloured lines show global and region values for each metric. Each point in a line represents 1 year starting at 1990 and ending at 2015. In all regions, SDI has increased year on year so progress in SDI is associated with later years for a given region. The black lines indicate trajectories for each geography expected on the basis of SDI alone. GBD=Global Burden of Disease. SDI=Socio-demographic Index. HALE=healthy life expectancy. DALYs=disability-adjusted life-years.

Venezuela), and each had observed burden far surpassing expected levels. Throughout sub-Saharan Africa, HIV/AIDS and malaria resulted in far more DALYs than expected based on SDI.

Heterogeneous trends across and within regions emerged in terms of both leading causes of DALYs and ratios of observed to expected levels. For instance, south Asia's disease burden landscape diverged from global patterns, with both ischaemic heart disease and neonatal disorders ranking among some of the leading causes of burden and often resulting in higher-than-expected DALYs (figure 7). Stroke and lower respiratory infections resulted in fewer DALYs than expected for most countries in south Asia, yet other causes exacted more DALYs than expected on the basis of SDI (eg, tuberculosis in India and drowning in Bangladesh). Further, the 2015 Nepal earthquake resulted in forces of nature being its leading cause of DALYs that year. Many countries in central Asia experienced observed DALYs that surpassed expected levels due to both Group 1 causes (eg, lower respiratory

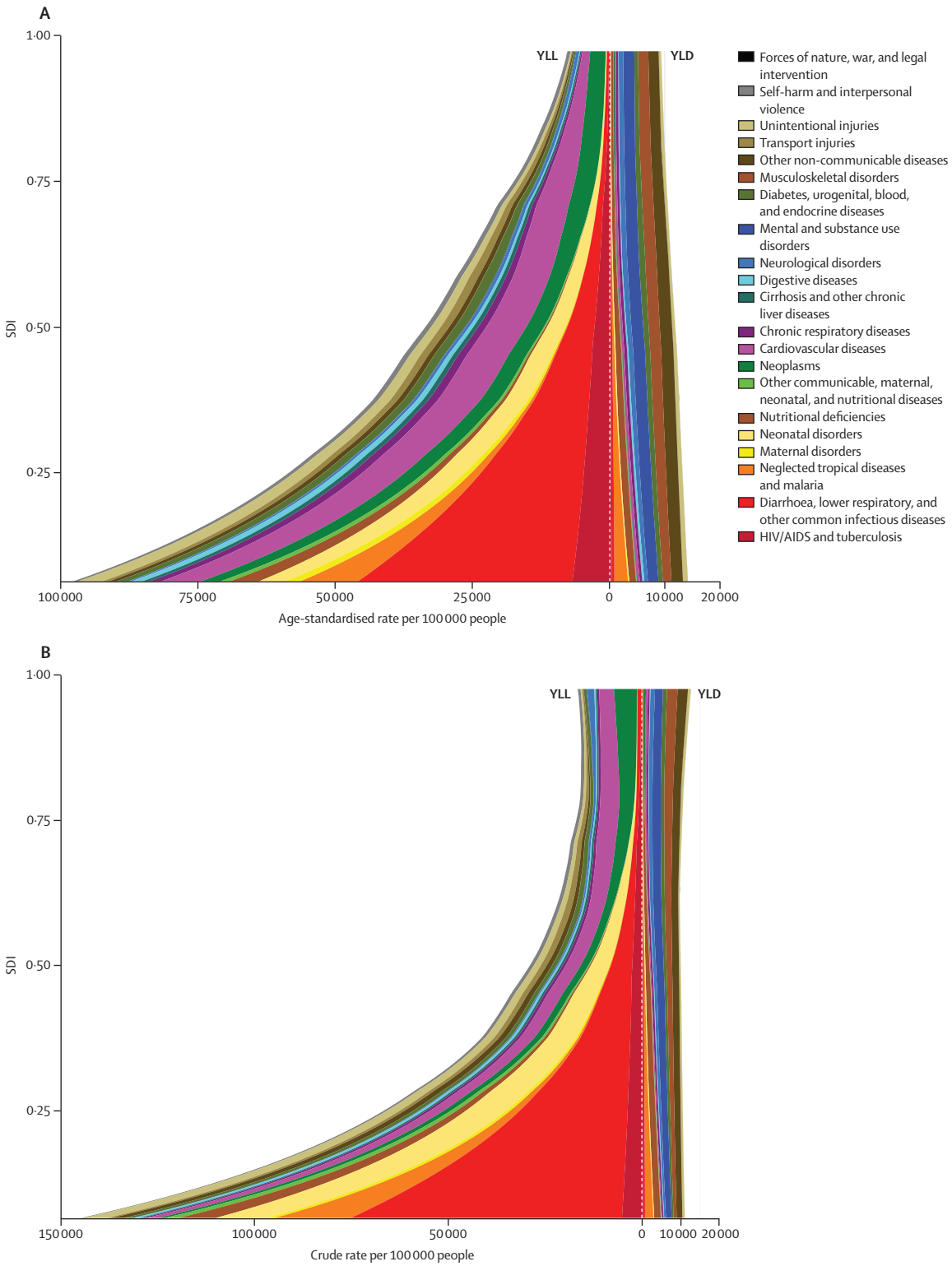

Figure 5: **Expected relationship between age-standardised YLL and YLD rates and SDI (A) and all-age YLL and YLD rates (per 100 000) and SDI (B) for 21 GBD Level 2 causes**

These stacked curves represent the average relationship between SDI and each cause observed across all geographies over the time period 1990 to 2015. In each figure, the y axis goes from lowest SDI to highest SDI. The left side shows rates for YLLs and the right side shows rates for YLDs; higher rates are further from the midline. The difference between (A) and (B) is the effect of shifts in population age structure expected with SDI. GBD=Global Burden of Disease. SDI=Socio-demographic Index. YLDs=years lived with disability. YLLs=years of life lost.

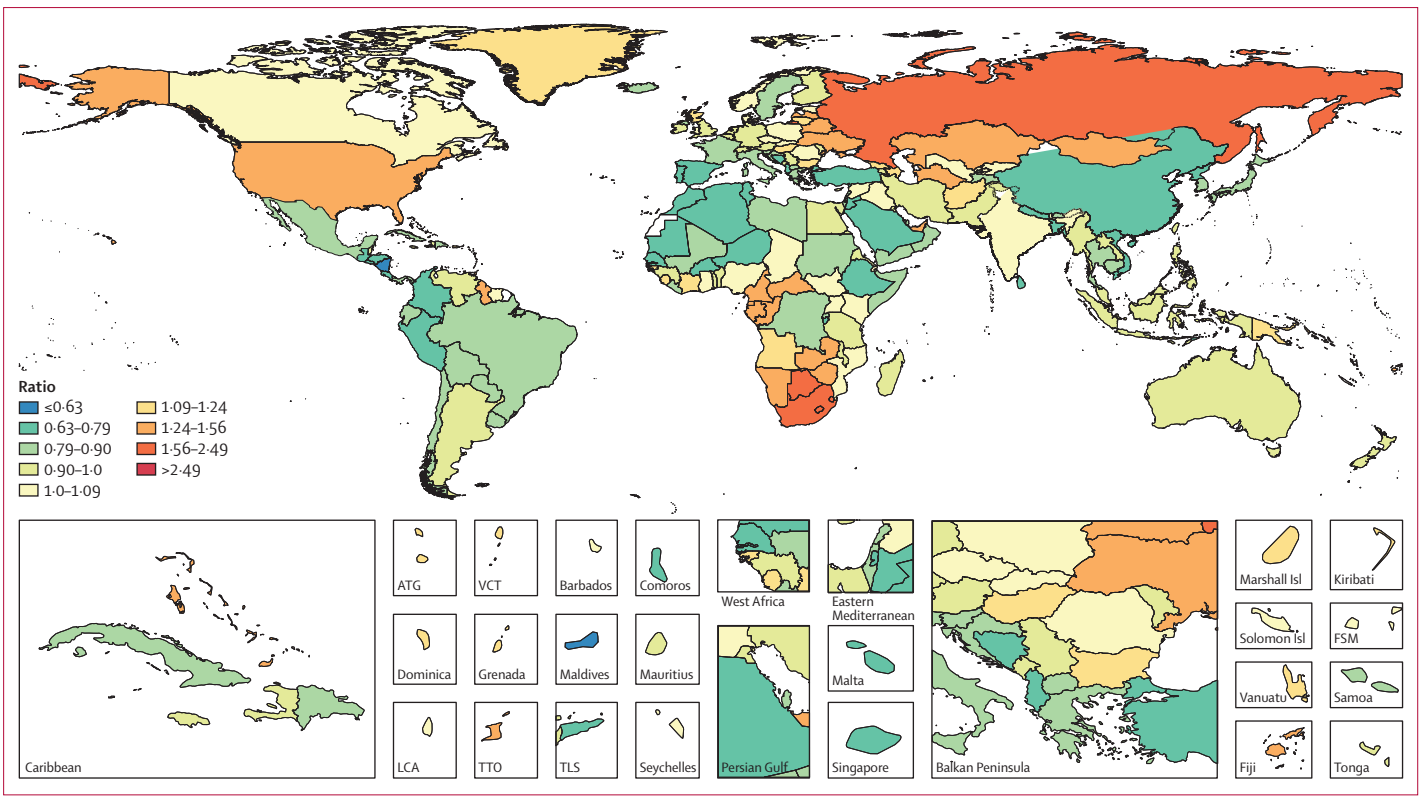

Figure 6: **Ratio of observed versus expected age-standardised DALY rates (per 100 000) on the basis of SDI alone for both sexes combined, 2015**
Ratios are colour-coded in terms of the magnitude of differences between observed and expected all-ages DALY rates. Blues indicate much lower observed DALYs than expected levels based on SDI, whereas reds reflect that observed DALYs far exceed expected levels given SDI. ATG=Antigua and Barbuda. VCT=Saint Vincent and the Grenadines. LCA=Saint Lucia. TTO=Trinidad and Tobago. TLS=Timor-Leste. FSM=Federated States of Micronesia. SDI=Socio-demographic Index. DALY=disability-adjusted life-years.

infections, preterm birth complications, and neonatal encephalopathy) and NCDs such as hypertensive heart disease. War was the leading cause of DALYs in five countries in north Africa and the Middle East in 2015, including Afghanistan, Iraq, Libya, Syria, and Yemen. Although neonatal sepsis frequently led to higher-than-expected DALYs in sub-Saharan Africa, burden from preterm birth complications fell below expected levels, on the basis of SDI, in most countries. Notably, NCDs such as diabetes ranked among the leading ten causes of DALYs for a subset of countries in sub-Saharan Africa (eg, South Africa), whereas nutritional deficiencies also remained among leading causes of burden in others (eg, Ghana and Zimbabwe); in both instances, observed DALYs generally exceeded expected levels.

Discussion

GBD 2015 results show that the world has become healthier in the past 25 years. Yet, this progress has not been universal. From 1990 to 2015, global HALE at birth increased from 56·7 years to 62·8 years, with 191 of 199 countries or territories recording improved HALE. Since 1990, global HALE at age 65 years also improved by 1·8 years, with an increase in 179 countries or territories. The global number of years of functional health lost grew during this time, from 8·2 years to 9·1 years. With YLL rates falling at a much faster pace than YLD rates, non-fatal health loss accounted for an increasing proportion of global DALYs, rising from 21·2% in 1990, to 32·1% in 2015. Worldwide progress was largely driven by rapid reductions in DALYs from communicable, maternal, neonatal, and nutritional diseases, although declines in age-standardised DALY rates from NCDs and injuries also contributed to overarching gains. Despite reductions in age-standardised DALY rates, 137 causes had statistically significant increases in total DALYs since 2005, a trend with extensive implications for health systems. Mental and substance use disorders, musculoskeletal disorders, and a range of other conditions including idiopathic developmental intellectual disability, vision and hearing impairment, and neurological disorders all saw rising disease burden since 2005, and few saw any evidence of declining age-specific YLD rates.

Considerable research and policy attention has considered the existence of compression of morbidity, or whether people live healthier lives as their lifespans extend.[30] Beyond its profound consequences for financing health systems, compression of morbidity has considerable implications for societal structures and expectations about longevity of careers or timing of

retirement. Compression can be interpreted in both absolute and relative terms. Absolute compression implies that as people live longer lives, they lose fewer years due to functional health loss, whereas relative compression implies that as people live longer lives, the ratio of years of functional health lost to life expectancy declines. Although some evidence shows that compression occurs among people with specific diseases such as diabetes and dementia,[31,32] national studies show more mixed results.[33–35] This might not be surprising, as most national studies rely on self-reported health status and chronic conditions, which are then further complicated by variations in how individuals use the response scales and profound framing effects.[36–39] By contrast, the GBD study provides a more comprehensive and comparable assessment of changes in functional health status by synthesising many types of data, by cause, and applying standardised disability weights to reflect the public's average views of severity of different conditions. GBD 2015 results unequivocally show that as life expectancy increases, people spend more time with reduced functional health status, and thus absolute expansion of morbidity has occurred. This trend is driven by marked declines in age-specific mortality at the same time minimal improvement, if any, has occurred for age-specific YLDs per capita. The proportion of lifespans spent in ill health has remained comparatively constant since 1990, and did not vary as a function of SDI; thus, we found nominal evidence of relative compression at the global level.

Drawing from our empirical characterisation of epidemiological transitions on the basis of SDI, we found that life expectancy and HALE increased linearly with SDI, whereas years of functional health lost climbed with rising SDI. Historically, increases in SDI are associated with a rapid decrease in burden from communicable, neonatal, maternal, and nutritional diseases, the leading killers of children, adolescent girls, and women. Efforts to increase income, provide more years of education, and reduce adolescent and total fertility rates thus might catalyse additional gains for life expectancy, HALE, and reduced disease burden, emphasising the critical role of policy interventions beyond more traditional health service delivery.

At different locations in this continuous process of change, we see evidence of a so-called double burden of disease: from a SDI of approximately 0·35 to 0·60, we expect NCDs and Group 1 causes to each account for at least 20% of disease burden. The average relationships with SDI imply that within a country with wide inequalities in SDI, we should also expect wide variation in disease burden patterns. Subnational disparities might be consistent with variations in subnational SDI, either recording higher or lower burden than that of the national level. Use of average patterns can help to benchmark a country against others, but such assessments can also help to provide insights as to whether public action or other factors are helping make inequalities narrower than expected based on SDI alone. Given the complexity of health patterns identified for many causes and differential patterns by age and sex, providing some understanding of expected patterns on the basis of SDI alone can help to anchor the exploration of results and could provide some measure of the performance of health systems or the magnitude of avertable burden within each country or territory.

The *Lancet* Commission on Investing in Health[40] galvanised considerable interest in the notion of a "grand convergence", such that levels of under-5 mortality, maternal mortality, and some infectious diseases could converge across all countries within a generation. Convergence can be achieved through progress on increasing SDI (ie, increasing per-capita income and average years of schooling, and reducing fertility) and reducing or inverting high ratios between observed and expected (based on SDI alone) health expectancies and health gaps. The Commission has argued that, within a generation, preventable deaths in children and mothers could largely be avoided through increased investment of development assistance for health and expanded national expenditure on health. The vision inspired some of the absolute threshold SDG targets, including reducing under-5 mortality to 25 deaths per 1000 livebirths, neonatal mortality to 12 deaths per 1000 livebirths, and maternal mortality ratio to 70 deaths per 100 000 livebirths. The relationships between these health outcomes, broader health measures, and SDI offer a framework by which the likelihood of such a grand convergence can be assessed. Based on GBD 2015 results, the historical relationship between SDI and health suggests that convergence in the sense of reduced absolute differences in rates is likely to occur with faster improvements in SDI. However, if convergence means smaller relative differences, then improvements in SDI alone might not be sufficient. Our findings show that continued SDI improvement does not appear to be historically associated with absolute convergence in life expectancy or HALE. The *Lancet* Commission also emphasised the importance of hastening progress through strategic investments by donors and governments in effective health technologies, an approach that has the potential to catalyse faster progress than what would be expected on the basis of SDI alone. Convergence in this scenario could then be interpreted as reduction in the ratio of observed to expected burden for low-income and lower-middle-income countries (LMICs), and could be used as an indirect, but summary, metric to monitor health system performance and overall progress toward the SDGs. Since history provides a perspective for identifying which countries have been able to reduce their ratio of observed to expected health outcomes, the comprehensive and longitudinal approach of the GBD is optimally suited for monitoring health system-driven convergence at a macro-level. The same tools can also therefore be used to generate insights on

	1	2	3	4	5	6	7	8	9	10
Global	IHD (0·92)	Stroke (0·93)	LRI (0·65)	Back & neck (0·96)	NN Preterm (0·72)	Diarrhoea (0·76)	Sense (1·00)	NN Enceph (1·17)	Road injuries (0·80)	HIV (0·66)
High income	IHD (0·91)	Back & neck (1·11)	Sense (0·94)	Lung C (0·98)	Stroke (0·59)	Diabetes (1·32)	Alzheimer's (0·77)	Depression (1·11)	COPD (1·24)	Skin (0·92)
High-income North America	IHD (1·79)	Back & neck (1·08)	Diabetes (2·48)	Lung C (1·30)	Depression (1·31)	COPD (2·35)	Alzheimer's (0·97)	Drugs (3·82)	Sense (0·89)	Other MSK (1·79)
Canada	Back & neck (1·31)	IHD (1·31)	Lung C (1·20)	Alzheimer's (0·92)	Sense (0·91)	Diabetes (1·75)	Depression (0·98)	Other MSK (1·56)	Skin (1·02)	Stroke (0·55)
Greenland	Self-harm (4·70)	Lung C (2·65)	IHD (0·74)	Back & neck (1·10)	NN Preterm (1·60)	Stroke (0·81)	Congenital (0·80)	COPD (1·81)	Other MSK (2·14)	Skin (1·04)
USA	IHD (1·84)	Back & neck (1·05)	Diabetes (2·57)	Lung C (1·31)	Depression (1·34)	COPD (2·49)	Drugs (4·01)	Alzheimer's (0·98)	Sense (0·89)	Other MSK (1·81)
Australasia	Back & neck (1·12)	IHD (1·01)	Depression (1·30)	Other MSK (1·87)	Sense (0·84)	Diabetes (1·36)	Lung C (0·78)	Stroke (0·56)	Skin (0·93)	Anxiety (1·72)
Australia	Back & neck (1·12)	IHD (1·02)	Depression (1·33)	Other MSK (1·93)	Sense (0·84)	Diabetes (1·36)	Lung C (0·78)	Stroke (0·57)	Skin (0·93)	Drugs (2·93)
New Zealand	Back & neck (1·15)	IHD (0·96)	Depression (1·14)	Diabetes (1·40)	Sense (0·85)	Lung C (0·79)	Stroke (0·53)	COPD (1·38)	Skin (0·93)	Other MSK (1·52)
High-income Asia Pacific	Back & neck (0·84)	Stroke (0·74)	IHD (0·52)	Sense (1·04)	Alzheimer's (0·68)	Self-harm (1·25)	LRI (0·83)	Lung C (0·70)	Diabetes (0·93)	Depression (0·86)
Brunei	Diabetes (4·62)	IHD (2·13)	Back & neck (0·82)	Stroke (1·59)	Road injuries (2·44)	Skin (0·94)	Depression (0·90)	Congenital (1·56)	Sense (1·05)	Iron (1·06)
Japan	IHD (0·52)	Back & neck (0·82)	Sense (1·05)	Stroke (0·69)	Alzheimer's (0·67)	LRI (0·89)	Lung C (0·66)	Self-harm (1·20)	Stomach C (1·15)	Colorect C (0·77)
Singapore	IHD (0·92)	LRI (1·88)	Back & neck (0·60)	Sense (1·01)	Stroke (0·61)	Depression (0·95)	Skin (0·94)	Lung C (0·75)	CKD (1·13)	Colorect C (0·82)
South Korea	Back & neck (0·90)	Stroke (0·97)	Self-harm (1·45)	Diabetes (1·76)	Sense (1·02)	IHD (0·46)	Lung C (0·85)	Liver C (2·42)	Depression (0·83)	Skin (0·91)
Western Europe	Back & neck (1·27)	IHD (0·75)	Sense (0·94)	Lung C (0·93)	Stroke (0·49)	Alzheimer's (0·73)	Depression (1·05)	Diabetes (0·91)	COPD (0·99)	Migraine (1·17)
Andorra	Back & neck (1·41)	IHD (0·78)	Sense (0·91)	Alzheimer's (0·66)	Depression (1·12)	Lung C (0·66)	Stroke (0·44)	Falls (1·07)	Skin (0·87)	Migraine (1·15)
Austria	IHD (1·05)	Back & neck (1·22)	Sense (0·93)	Lung C (0·87)	Alzheimer's (0·71)	Depression (1·07)	Stroke (0·47)	Diabetes (1·09)	Migraine (1·29)	Falls (1·16)
Belgium	Back & neck (1·39)	IHD (0·85)	Lung C (1·22)	Sense (1·06)	Alzheimer's (0·83)	Stroke (0·55)	COPD (1·41)	Depression (1·01)	Self-harm (1·02)	Diabetes (1·02)
Cyprus	Back & neck (1·40)	IHD (1·03)	Diabetes (1·66)	Sense (0·96)	Depression (1·07)	Road injuries (1·54)	Stroke (0·49)	Migraine (1·14)	Skin (0·90)	Lung C (0·67)
Denmark	Back & neck (1·45)	IHD (1·08)	Lung C (1·22)	COPD (2·17)	Stroke (0·78)	Alzheimer's (0·86)	Sense (0·79)	Diabetes (1·40)	Depression (1·10)	Skin (0·94)
Finland	IHD (1·30)	Back & neck (1·38)	Alzheimer's (0·96)	Stroke (0·64)	Sense (0·85)	Depression (1·23)	Falls (1·62)	Lung C (0·69)	Self-harm (1·00)	Diabetes (0·92)
France	Back & neck (1·15)	IHD (0·43)	Sense (0·92)	Lung C (1·01)	Depression (1·03)	Alzheimer's (0·63)	Stroke (0·33)	Self-harm (0·96)	Falls (1·17)	Diabetes (0·70)
Germany	IHD (1·27)	Back & neck (1·48)	Sense (0·98)	Lung C (0·95)	Stroke (0·62)	Depression (1·08)	Alzheimer's (0·61)	Diabetes (1·16)	COPD (1·26)	Colorect C (0·79)
Greece	IHD (0·89)	Back & neck (1·28)	Stroke (0·67)	Sense (0·95)	Lung C (1·00)	Alzheimer's (0·75)	Depression (1·21)	COPD (0·97)	Road injuries (1·05)	Diabetes (0·58)
Iceland	Back & neck (1·38)	IHD (0·96)	Sense (0·93)	Lung C (0·77)	Depression (0·89)	Alzheimer's (0·77)	Migraine (1·15)	Skin (0·77)	Stroke (0·41)	Anxiety (1·23)
Ireland	Back & neck (1·25)	IHD (1·12)	Sense (0·92)	Depression (1·07)	Lung C (0·88)	Skin (0·90)	Migraine (1·14)	Stroke (0·51)	Anxiety (1·58)	COPD (1·28)
Israel	Back & neck (1·20)	IHD (0·54)	Diabetes (1·47)	Sense (0·94)	Depression (1·10)	Skin (0·91)	Migraine (1·14)	Stroke (0·37)	Lung C (0·68)	Alzheimer's (0·73)
Italy	Back & neck (1·31)	IHD (0·63)	Sense (1·09)	Stroke (0·49)	Alzheimer's (0·81)	Lung C (0·82)	Diabetes (1·10)	Depression (1·06)	Migraine (1·39)	Skin (0·85)

(Figure 7 continues on next page)

progress, or lack thereof, on specific diseases and outcomes of interest. In some cases, there might be historical or geographical explanations for high burden for some conditions. In other cases, effective preventive and treatment measures have just not yet been implemented or are not functioning effectively.

Shifting from the MDGs to the SDGs dramatically broadened the global health agenda.[2,3] The SDGs include 17 goals, 169 targets, and 230 indicators; of these measures, 11 goals, 28 targets, and 46 indicators are health related.[41] At present, 33 of the 46 health-related indicators are measured by the GBD study. Amid earlier

	1	2	3	4	5	6	7	8	9	10
Luxembourg	Back & neck (1·42)	IHD (0·90)	Sense (0·92)	Depression (1·11)	Lung C (0·95)	Stroke (0·59)	Alzheimer's (0·71)	Migraine (1·28)	Diabetes (1·23)	Skin (0·86)
Malta	IHD (0·67)	Back & neck (1·31)	Sense (0·89)	Diabetes (0·97)	Depression (1·02)	Stroke (0·32)	Lung C (0·65)	Alzheimer's (0·76)	Skin (1·00)	Migraine (1·13)
Netherlands	Back & neck (1·50)	IHD (0·82)	Lung C (1·28)	Sense (0·90)	Alzheimer's (0·88)	COPD (1·60)	Diabetes (1·26)	Stroke (0·55)	Depression (0·99)	Skin (0·89)
Norway	Back & neck (1·59)	IHD (1·17)	Lung C (0·90)	Alzheimer's (0·80)	Sense (0·81)	Depression (1·03)	Stroke (0·68)	COPD (1·69)	Anxiety (1·87)	Diabetes (1·25)
Portugal	Back & neck (1·34)	Stroke (0·49)	IHD (0·32)	Sense (0·83)	Diabetes (0·75)	Depression (1·09)	Alzheimer's (0·73)	Lung C (0·74)	LRI (0·61)	Colorect C (0·94)
Spain	Back & neck (0·97)	IHD (0·45)	Sense (0·99)	Alzheimer's (0·84)	Depression (1·09)	Lung C (0·81)	Stroke (0·34)	Diabetes (0·70)	Migraine (1·15)	COPD (0·84)
Sweden	IHD (1·07)	Back & neck (1·25)	Stroke (0·57)	Alzheimer's (0·78)	Sense (0·78)	Diabetes (1·30)	Depression (1·05)	COPD (1·22)	Lung C (0·63)	Skin (0·90)
Switzerland	Back & neck (1·48)	IHD (0·95)	Sense (0·90)	Alzheimer's (0·76)	Depression (1·08)	Lung C (0·81)	Falls (1·38)	Skin (0·88)	Stroke (0·46)	Migraine (1·08)
UK	IHD (0·96)	Back & neck (1·17)	Lung C (1·00)	Stroke (0·63)	COPD (1·60)	Sense (0·79)	Alzheimer's (0·73)	Depression (0·96)	Skin (0·90)	LRI (0·72)
England	IHD (0·92)	Back & neck (1·17)	Lung C (0·95)	Stroke (0·61)	Sense (0·79)	COPD (1·56)	Alzheimer's (0·72)	Depression (0·95)	Skin (0·89)	LRI (0·71)
Northern Ireland	IHD (0·75)	Back & neck (1·11)	Lung C (1·05)	Stroke (0·47)	COPD (1·31)	Sense (0·73)	Depression (0·97)	Alzheimer's (0·79)	LRI (0·74)	Skin (0·88)
Scotland	IHD (1·49)	Back & neck (1·23)	Lung C (1·42)	Stroke (0·93)	COPD (2·12)	Migraine (1·75)	Sense (0·79)	Alzheimer's (0·75)	Depression (0·97)	Asthma (2·13)
Wales	IHD (1·07)	Back & neck (1·15)	Lung C (1·05)	Stroke (0·65)	Alzheimer's (0·87)	COPD (1·66)	Sense (0·79)	Depression (1·07)	Asthma (2·28)	LRI (0·77)
Southern Latin America	IHD (0·66)	Back & neck (0·88)	Stroke (0·54)	LRI (1·18)	Depression (1·07)	Sense (0·84)	Diabetes (0·99)	Road injuries (0·81)	Congenital (1·07)	Skin (0·97)
Argentina	IHD (0·75)	Back & neck (0·87)	LRI (1·45)	Stroke (0·52)	Depression (1·07)	Diabetes (1·02)	Sense (0·84)	Congenital (1·09)	Road injuries (0·81)	Skin (0·97)
Chile	Back & neck (0·88)	IHD (0·49)	Stroke (0·59)	Depression (1·10)	Sense (0·86)	Diabetes (1·00)	Skin (0·97)	Road injuries (0·81)	Anxiety (1·57)	Self-harm (0·78)
Uruguay	IHD (0·49)	Stroke (0·57)	Back & neck (0·89)	Lung C (1·19)	Sense (0·80)	COPD (1·05)	Depression (1·03)	Diabetes (0·68)	Self-harm (1·20)	Road injuries (0·76)
Central Europe, eastern Europe, and central Asia	IHD (2·45)	Stroke (1·71)	Back & neck (1·20)	Sense (1·16)	Self-harm (1·42)	Lung C (1·05)	Depression (1·10)	LRI (1·06)	Road injuries (1·20)	Diabetes (0·93)
Eastern Europe	IHD (3·25)	Stroke (2·12)	Back & neck (1·21)	Self-harm (1·83)	Sense (1·25)	CMP (7·41)	Road injuries (1·74)	Drugs (6·23)	Depression (1·17)	Alcohol (8·90)
Belarus	IHD (4·09)	Stroke (2·00)	Back & neck (1·19)	Self-harm (1·95)	Sense (1·18)	Road injuries (2·00)	Lung C (1·28)	Falls (1·90)	Drugs (6·47)	Depression (1·15)
Estonia	IHD (1·89)	Back & neck (1·16)	Stroke (0·92)	Sense (1·08)	HTN HD (7·31)	Depression (1·25)	Lung C (0·89)	Alcohol (8·56)	Diabetes (0·96)	Alzheimer's (0·59)
Latvia	IHD (2·50)	Stroke (1·73)	Back & neck (1·24)	Sense (1·22)	CMP (6·87)	Self-harm (1·20)	Lung C (0·95)	Diabetes (1·26)	Depression (0·97)	Alcohol (6·81)
Lithuania	IHD (2·21)	Stroke (1·15)	Back & neck (1·23)	Self-harm (2·03)	Sense (1·17)	Depression (1·16)	Lung C (0·90)	Road injuries (1·26)	Diabetes (0·89)	Alcohol (7·02)
Moldova	IHD (1·45)	Stroke (1·05)	Back & neck (1·20)	Sense (0·96)	Depression (1·00)	Cirr Alc (4·21)	Self-harm (1·06)	LRI (0·75)	Skin (0·94)	Road injuries (0·51)
Russia	IHD (3·28)	Stroke (2·49)	Back & neck (1·20)	Self-harm (2·00)	Sense (1·30)	CMP (9·71)	Road injuries (2·09)	Alcohol (10·72)	Drugs (5·90)	Depression (1·14)
Ukraine	IHD (3·35)	Stroke (1·52)	Back & neck (1·26)	Sense (1·17)	Drugs (8·36)	Depression (1·29)	Self-harm (1·36)	Lung C (0·84)	HIV (1·64)	Road injuries (1·12)
Central Europe	IHD (1·46)	Stroke (1·19)	Back & neck (1·29)	Lung C (1·27)	Sense (1·10)	Diabetes (1·09)	Depression (1·06)	Colorect C (1·03)	Self-harm (0·86)	Road injuries (0·93)
Albania	IHD (0·90)	Stroke (0·99)	Back & neck (1·37)	Sense (0·94)	Depression (0·98)	Lung C (0·93)	Other Cardio (1·93)	Skin (0·81)	Iron (1·25)	Congenital (0·77)

(Figure 7 continues on next page)

discussions and negotiations over SDG 3 indicators, HALE was proposed as an indicator of overarching health status and progress;[2] this proposal was not ultimately adopted in the final set of indicators. HALE provides a strong summary measure of overall health status because it accounts for functional health loss in addition to age-specific mortality. Other summary development measures, such as the Human Development Index, have considered replacing life expectancy with HALE as an input to the overall assessment.[42] The GBD study measures health outcomes that are both amenable to intervention and could be risk

	1	2	3	4	5	6	7	8	9	10
Bosnia and Herzegovina	IHD (0·62)	Stroke (0·72)	Back & neck (1·16)	Diabetes (1·08)	Sense (0·98)	Lung C (1·16)	CMP (5·19)	Depression (0·98)	Skin (0·86)	Colorect C (0·91)
Bulgaria	IHD (1·74)	Stroke (1·59)	Back & neck (1·28)	Sense (1·04)	Lung C (1·12)	Diabetes (1·15)	HTN HD (5·12)	Other Cardio (2·40)	Depression (1·06)	Colorect C (1·06)
Croatia	IHD (1·00)	Back & neck (1·37)	Stroke (0·85)	Lung C (1·21)	Sense (0·97)	Diabetes (0·78)	Depression (1·04)	Colorect C (1·13)	Alzheimer's (0·69)	COPD (0·77)
Czech Republic	IHD (2·15)	Back & neck (1·38)	Stroke (1·09)	Sense (1·09)	Lung C (1·11)	Diabetes (1·48)	Depression (1·13)	Colorect C (1·15)	Alzheimer's (0·62)	Skin (0·87)
Hungary	IHD (1·82)	Back & neck (1·38)	Stroke (1·04)	Lung C (1·61)	Sense (1·05)	Diabetes (1·50)	Colorect C (1·31)	Depression (1·07)	COPD (1·46)	Self-harm (0·96)
Macedonia	Stroke (1·53)	IHD (0·98)	Back & neck (1·26)	Diabetes (1·22)	Sense (0·99)	Lung C (1·11)	Depression (1·01)	CMP (3·63)	Skin (0·86)	Migraine (0·98)
Montenegro	IHD (1·18)	Stroke (1·64)	Back & neck (1·27)	Lung C (1·43)	Sense (1·04)	Diabetes (1·17)	Depression (1·04)	Skin (0·88)	Road injuries (0·72)	CMP (3·14)
Poland	IHD (1·67)	Back & neck (1·21)	Stroke (1·02)	Lung C (1·45)	Sense (1·27)	Diabetes (1·25)	Depression (1·07)	Self-harm (1·06)	Road injuries (1·37)	Colorect C (1·03)
Romania	IHD (1·39)	Stroke (1·53)	Back & neck (1·33)	Sense (1·03)	Lung C (1·04)	Depression (1·04)	HTN HD (3·57)	LRI (0·73)	Diabetes (0·64)	Road injuries (0·81)
Serbia	IHD (1·03)	Stroke (1·27)	Back & neck (1·31)	Lung C (1·38)	Diabetes (1·23)	Sense (1·00)	Depression (1·02)	Colorect C (1·13)	Self-harm (0·96)	Road injuries (0·71)
Slovakia	IHD (2·05)	Back & neck (1·34)	Stroke (1·05)	Sense (1·06)	Lung C (1·02)	Depression (1·08)	Diabetes (1·20)	Colorect C (1·24)	Skin (0·88)	LRI (0·83)
Slovenia	Back & neck (1·35)	IHD (0·76)	Stroke (0·63)	Sense (0·99)	Lung C (0·86)	Depression (1·09)	Diabetes (0·97)	Alzheimer's (0·62)	Self-harm (0·84)	Colorect C (0·85)
Central Asia	IHD (1·95)	Stroke (1·44)	LRI (2·00)	Back & neck (1·01)	NN Preterm (1·00)	NN Enceph (2·17)	Congenital (0·86)	Road injuries (0·70)	Sense (0·98)	Depression (0·97)
Armenia	IHD (1·52)	Stroke (0·87)	Diabetes (1·71)	Back & neck (1·00)	Sense (1·03)	Lung C (1·29)	Depression (1·01)	Congenital (1·21)	COPD (0·93)	Road injuries (0·64)
Azerbaijan	IHD (2·31)	LRI (3·36)	Stroke (1·25)	Back & neck (0·98)	NN Enceph (7·12)	Diabetes (1·53)	NN Preterm (2·17)	Sense (1·08)	Depression (1·02)	Congenital (1·07)
Georgia	IHD (1·70)	Stroke (1·55)	Back & neck (0·93)	Diabetes (1·26)	Sense (1·05)	Road injuries (1·05)	Depression (1·01)	Lung C (0·95)	COPD (1·07)	HTN HD (3·42)
Kazakhstan	IHD (2·77)	Stroke (2·18)	Back & neck (1·04)	Self-harm (2·14)	Road injuries (1·46)	NN Preterm (2·88)	Iron (2·40)	Congenital (1·21)	LRI (1·76)	Sense (1·10)
Kyrgyzstan	IHD (1·62)	Stroke (1·54)	LRI (1·19)	NN Preterm (0·98)	NN Enceph (1·61)	Back & neck (1·04)	Congenital (0·92)	Road injuries (0·69)	Iron (1·30)	Depression (0·91)
Mongolia	IHD (1·82)	Stroke (2·67)	Self-harm (3·02)	LRI (2·19)	Liver C (10·57)	NN Enceph (3·29)	Back & neck (0·98)	Road injuries (1·07)	Congenital (1·11)	NN Preterm (0·91)
Tajikistan	LRI (1·27)	IHD (1·19)	NN Preterm (0·66)	Stroke (0·90)	Back & neck (1·06)	Diarrhoea (1·02)	Congenital (0·70)	NN Enceph (0·82)	Iron (1·04)	Haemog (3·79)
Turkmenistan	IHD (2·96)	LRI (6·42)	Stroke (2·21)	Congenital (1·76)	Back & neck (0·94)	NN Preterm (2·59)	NN Enceph (5·53)	Diabetes (1·56)	Depression (1·00)	Sense (1·06)
Uzbekistan	IHD (1·71)	LRI (2·53)	Stroke (1·12)	Back & neck (1·00)	NN Enceph (2·60)	HTN HD (5·41)	Depression (0·94)	Diabetes (0·89)	Road injuries (0·60)	Sense (0·93)
Latin America and Caribbean	IHD (0·63)	Violence (4·14)	Back & neck (0·87)	Diabetes (1·21)	Road injuries (0·83)	Sense (1·06)	Stroke (0·55)	Depression (1·08)	LRI (0·75)	CKD (1·34)
Central Latin America	Violence (4·78)	IHD (0·60)	Diabetes (1·55)	Back & neck (0·86)	CKD (1·88)	Sense (1·12)	Congenital (0·96)	Road injuries (0·72)	Depression (0·94)	LRI (0·68)
Colombia	Violence (6·04)	IHD (0·50)	Back & neck (0·94)	Sense (1·14)	Depression (1·02)	Skin (1·06)	Road injuries (0·61)	Congenital (0·87)	Diabetes (0·70)	Stroke (0·35)
Costa Rica	Back & neck (0·89)	IHD (0·43)	Sense (1·16)	Depression (1·01)	Road injuries (0·63)	CKD (1·25)	Congenital (0·92)	Skin (0·91)	Diabetes (0·56)	Iron (1·01)
El Salvador	Violence (8·82)	IHD (0·57)	CKD (2·01)	Back & neck (0·94)	Diabetes (0·88)	Road injuries (0·77)	Sense (0·96)	Iron (1·59)	LRI (0·60)	Depression (0·90)
Guatemala	LRI (1·04)	Violence (4·70)	Diabetes (1·44)	Diarrhoea (0·90)	Back & neck (0·96)	IHD (0·47)	Congenital (0·67)	Iron (1·05)	CKD (1·37)	Sense (0·94)

(Figure 7 continues on next page)

standardised, thus offering a useful set of metrics to monitor progress toward specific SDG targets, such as the aim of target 3.8 to achieving effective universal health coverage.

DALYs and other health-gap metrics are one of many potential inputs when setting health policy and investment priorities, but major research organisations and funders such as the US National Institutes of Health and others note the use of DALYs to inform budgeting decisions.[43–46] Beyond health metrics, many other inputs are required for decision making, ranging from the effectiveness of different adoptable policies and programmes, to key

	1	2	3	4	5	6	7	8	9	10
Honduras	Violence (5·08)	IHD (0·96)	Stroke (0·83)	Congenital (1·03)	Back & neck (0·98)	Sense (0·95)	Skin (1·04)	Diabetes (0·72)	Depression (0·88)	NN Preterm (0·40)
Mexico	Diabetes (2·22)	IHD (0·59)	CKD (2·59)	Back & neck (0·79)	Sense (1·17)	Congenital (1·09)	Violence (3·13)	Road injuries (0·76)	Depression (0·91)	Skin (0·93)
Nicaragua	CKD (1·76)	Back & neck (0·96)	IHD (0·44)	Diabetes (0·77)	Sense (0·95)	Congenital (0·71)	LRI (0·38)	Depression (0·87)	Skin (0·94)	Road injuries (0·39)
Panama	Back & neck (0·91)	IHD (0·48)	Diabetes (1·40)	Violence (4·60)	Sense (1·19)	Congenital (1·02)	Road injuries (0·83)	Depression (0·99)	Stroke (0·46)	LRI (1·04)
Venezuela	Violence (9·65)	IHD (0·86)	Iron (3·05)	Road injuries (1·15)	Back & neck (0·90)	Diabetes (1·35)	Sense (1·12)	Congenital (0·93)	Stroke (0·54)	CKD (1·64)
Andean Latin America	LRI (1·31)	Back & neck (0·93)	IHD (0·39)	Sense (1·07)	Depression (1·09)	Road injuries (0·67)	Iron (1·34)	Skin (1·01)	Diabetes (0·74)	Congenital (0·67)
Bolivia	LRI (1·04)	IHD (0·51)	Back & neck (1·00)	Stroke (0·62)	Iron (1·51)	NN Enceph (1·16)	Road injuries (0·60)	NN Preterm (0·55)	Sense (0·97)	CKD (1·31)
Ecuador	IHD (0·45)	LRI (1·18)	Back & neck (0·91)	Road injuries (0·95)	Diabetes (1·20)	Sense (1·02)	CKD (1·58)	Depression (1·08)	Congenital (0·78)	Iron (1·32)
Peru	LRI (1·58)	Back & neck (0·92)	Sense (1·14)	Depression (1·11)	IHD (0·32)	Skin (1·03)	Iron (1·28)	Road injuries (0·56)	Congenital (0·65)	Migraine (1·07)
Caribbean	IHD (0·93)	Stroke (0·82)	Diabetes (1·58)	HIV (1·09)	LRI (0·80)	Back & neck (0·89)	Sense (1·06)	Congenital (1·06)	Road injuries (0·85)	Depression (1·11)
Antigua	Diabetes (3·67)	IHD (1·07)	Stroke (1·19)	Back & neck (0·82)	Depression (1·20)	Sense (1·21)	Skin (1·12)	LRI (1·49)	CKD (2·03)	NN Preterm (3·06)
The Bahamas	IHD (1·20)	Diabetes (2·82)	Stroke (1·15)	Back & neck (0·82)	HIV (2·74)	Violence (12·84)	Sense (1·19)	Depression (1·18)	LRI (1·67)	HTN HD (9·97)
Barbados	Diabetes (2·95)	IHD (0·61)	Stroke (0·73)	Back & neck (0·81)	Sense (1·07)	LRI (1·22)	Depression (1·15)	Skin (1·20)	CKD (1·39)	Prostate C (3·69)
Belize	HIV (1·07)	Diabetes (1·73)	Violence (3·59)	IHD (0·70)	LRI (0·95)	Back & neck (0·84)	Road injuries (0·72)	Stroke (0·68)	NN Preterm (0·62)	Depression (1·04)
Bermuda	IHD (1·82)	Back & neck (0·89)	Diabetes (2·83)	Depression (1·25)	Sense (1·19)	Stroke (0·97)	Skin (1·04)	HIV (2·89)	Iron (1·32)	Lung C (0·99)
Cuba	IHD (0·78)	Stroke (0·57)	Back & neck (0·82)	Sense (1·11)	Lung C (1·12)	Depression (1·14)	Diabetes (0·82)	LRI (0·82)	Skin (1·08)	Alzheimer's (0·85)
Dominica	Diabetes (2·80)	IHD (0·67)	Stroke (0·72)	Back & neck (0·83)	CKD (2·21)	LRI (1·38)	Sense (1·07)	NN Preterm (1·91)	Depression (1·12)	Skin (1·16)
Dominican Republic	IHD (0·83)	NN Preterm (1·19)	Stroke (0·69)	Road injuries (0·92)	Back & neck (0·82)	HIV (0·75)	Congenital (0·89)	Sense (0·98)	Depression (1·07)	LRI (0·79)
Grenada	Diabetes (3·04)	IHD (0·91)	Stroke (1·16)	LRI (2·14)	Back & neck (0·80)	CKD (2·26)	Depression (1·11)	Sense (1·06)	Skin (1·18)	Road injuries (0·75)
Guyana	IHD (1·34)	HIV (2·34)	Diabetes (2·27)	Stroke (1·51)	Self-harm (2·36)	NN Preterm (0·97)	LRI (1·01)	Back & neck (0·84)	Road injuries (0·80)	Violence (2·80)
Haiti	HIV (1·53)	LRI (0·72)	Diarrhoea (0·71)	IHD (1·14)	Stroke (1·07)	Congenital (1·26)	Road injuries (1·00)	NN Preterm (0·46)	NN Enceph (0·76)	Diabetes (1·65)
Jamaica	Diabetes (2·28)	Stroke (0·85)	IHD (0·43)	Violence (4·13)	Back & neck (0·83)	NN Preterm (1·48)	Sense (1·00)	Depression (1·10)	CKD (1·39)	Skin (1·11)
Puerto Rico	Diabetes (3·97)	IHD (1·19)	Back & neck (0·88)	Sense (1·20)	Violence (22·36)	Depression (1·23)	CKD (1·97)	Stroke (0·61)	Skin (1·09)	LRI (1·07)
St Lucia	Diabetes (2·38)	Stroke (0·86)	IHD (0·55)	Back & neck (0·83)	Sense (1·05)	Depression (1·11)	LRI (1·16)	Violence (3·79)	Skin (1·14)	CKD (1·46)
Saint Vincent and the Grenadines	Diabetes (3·41)	IHD (0·99)	Stroke (1·00)	Back & neck (0·82)	Violence (4·84)	NN Preterm (1·94)	LRI (1·34)	Sense (1·05)	HIV (0·97)	Depression (1·10)
Suriname	IHD (0·75)	Stroke (1·09)	Diabetes (1·58)	NN Preterm (1·83)	HIV (0·96)	Self-harm (1·97)	Back & neck (0·82)	Road injuries (0·89)	LRI (1·19)	Congenital (1·09)
Trinidad and Tobago	Diabetes (6·79)	IHD (1·81)	Stroke (1·30)	Back & neck (0·81)	Violence (13·68)	Sense (1·17)	Depression (1·18)	CKD (2·22)	Road injuries (1·36)	HIV (1·81)
Virgin Islands	IHD (2·41)	Diabetes (3·58)	Stroke (1·12)	Back & neck (0·89)	Violence (28·20)	Sense (1·19)	CKD (2·14)	Prostate C (4·76)	Depression (1·24)	Skin (1·16)

(Figure 7 continues on next page)

social, cultural, and ethical considerations. Nonetheless, DALYs and other summary health measures might have an even more prominent role in the future in setting research and development priorities within the health sector, particularly in the absence of robust information on the effectiveness or likely success of various research projects and programmes.[47] As global health research funders increasingly use DALYs to shape priority-setting processes, health challenges faced by populations with less health-care market power, namely poor people, will inevitably receive more attention. Shifting to the use of disease burden for programme design and evaluation

	1	2	3	4	5	6	7	8	9	10
Tropical Latin America	IHD (0·67)	Violence (4·65)	Stroke (0·68)	Road injuries (0·98)	Back & neck (0·87)	Depression (1·23)	Diabetes (0·93)	Sense (0·99)	Anxiety (2·14)	LRI (0·67)
Brazil	IHD (0·67)	Violence (4·75)	Stroke (0·68)	Road injuries (0·98)	Back & neck (0·86)	Depression (1·23)	Diabetes (0·93)	Sense (0·99)	Anxiety (2·15)	LRI (0·67)
Paraguay	IHD (0·66)	Road injuries (0·93)	Stroke (0·76)	Back & neck (0·97)	Diabetes (1·11)	Depression (1·24)	Congenital (0·83)	NN Preterm (0·63)	Sense (0·97)	Skin (1·13)
Southeast Asia, east Asia, and Oceania	Stroke (1·17)	IHD (0·59)	Back & neck (0·86)	Road injuries (0·82)	COPD (1·21)	Sense (0·94)	Diabetes (0·67)	Lung C (1·25)	Skin (0·98)	Depression (0·74)
East Asia	Stroke (1·14)	IHD (0·53)	Back & neck (0·89)	COPD (1·29)	Road injuries (0·87)	Sense (0·91)	Lung C (1·36)	Liver C (3·16)	Depression (0·73)	Diabetes (0·47)
China	Stroke (1·14)	IHD (0·53)	Back & neck (0·88)	COPD (1·28)	Road injuries (0·86)	Sense (0·91)	Lung C (1·37)	Liver C (3·13)	Depression (0·74)	Diabetes (0·45)
North Korea	Stroke (1·52)	IHD (0·62)	COPD (1·68)	Back & neck (1·05)	Road injuries (0·94)	Liver C (4·38)	Sense (0·77)	Lung C (2·11)	Stomach C (2·43)	LRI (0·37)
Taiwan (province of China)	Diabetes (2·76)	Back & neck (0·99)	IHD (0·63)	Stroke (0·77)	Sense (1·08)	Liver C (3·50)	Lung C (0·88)	Road injuries (1·47)	Other MSK (1·57)	Skin (0·93)
Southeast Asia	Stroke (1·23)	IHD (0·75)	Diabetes (1·20)	LRI (0·89)	Back & neck (0·81)	Road injuries (0·74)	Sense (1·01)	TB (3·43)	NN Preterm (0·64)	Skin (1·07)
Cambodia	IHD (1·04)	LRI (0·63)	Stroke (1·00)	NN Preterm (0·66)	Road injuries (0·69)	Back & neck (0·94)	Congenital (0·74)	Iron (0·94)	HIV (0·37)	Sense (0·95)
Indonesia	Stroke (1·70)	IHD (0·93)	Diabetes (1·51)	TB (6·35)	Road injuries (0·76)	Back & neck (0·76)	NN Preterm (0·76)	Sense (0·99)	Diarrhoea (2·93)	LRI (0·68)
Laos	LRI (1·34)	NN Preterm (1·23)	IHD (1·12)	Stroke (1·08)	Congenital (1·08)	Road injuries (0·94)	Diarrhoea (0·78)	NN Enceph (0·76)	Back & neck (0·90)	Diabetes (1·13)
Malaysia	IHD (1·23)	LRI (2·28)	Stroke (0·94)	Road injuries (1·18)	Back & neck (0·75)	Diabetes (1·49)	Skin (1·15)	Sense (1·00)	Depression (0·84)	Other MSK (1·84)
Maldives	IHD (0·49)	Back & neck (0·82)	Sense (0·98)	Congenital (0·72)	Iron (1·35)	Skin (1·06)	Depression (0·75)	Stroke (0·34)	Diabetes (0·41)	Self-harm (0·69)
Mauritius	Diabetes (3·86)	IHD (0·93)	CKD (3·13)	Stroke (0·76)	Back & neck (0·82)	Sense (1·15)	Skin (1·10)	Depression (0·84)	Other MSK (1·72)	Asthma (1·58)
Myanmar	Stroke (1·14)	LRI (0·86)	TB (2·15)	Diabetes (1·07)	IHD (0·45)	Sense (1·13)	Back & neck (0·79)	COPD (1·12)	NN Enceph (1·08)	Congenital (0·84)
Philippines	IHD (1·11)	LRI (1·43)	Stroke (1·25)	Diabetes (1·30)	Back & neck (0·95)	Congenital (0·81)	NN Preterm (0·61)	Sense (1·05)	TB (3·97)	Skin (1·11)
Sri Lanka	IHD (0·72)	Diabetes (1·46)	Back & neck (0·81)	Self-harm (2·11)	Sense (1·14)	Stroke (0·56)	Asthma (2·09)	Skin (1·03)	Depression (0·81)	COPD (0·78)
Seychelles	IHD (0·82)	LRI (2·14)	Back & neck (0·79)	HTN HD (7·91)	Stroke (0·63)	CKD (2·20)	Sense (1·18)	Diabetes (1·26)	Skin (1·07)	Depression (0·84)
Thailand	IHD (0·44)	Stroke (0·63)	Road injuries (1·29)	LRI (1·61)	Diabetes (0·96)	Back & neck (0·73)	Sense (1·04)	Liver C (3·94)	CKD (1·34)	HIV (0·71)
Timor-Leste	LRI (0·60)	NN Preterm (0·59)	Congenital (0·78)	IHD (0·68)	Stroke (0·66)	Measles (3·94)	Diarrhoea (0·31)	NN Enceph (0·44)	Back & neck (0·87)	Skin (1·04)
Vietnam	Stroke (1·07)	IHD (0·40)	Road injuries (0·78)	Back & neck (0·85)	Sense (0·92)	Diabetes (0·60)	Lung C (1·88)	Skin (1·06)	Congenital (0·79)	Depression (0·77)
Oceania	LRI (1·07)	IHD (2·05)	Stroke (1·82)	Diabetes (3·91)	COPD (3·33)	Asthma (3·18)	Road injuries (0·96)	NN Preterm (0·42)	Iron (1·06)	CKD (2·38)
American Samoa	Diabetes (3·50)	IHD (1·11)	Skin (1·64)	Back & neck (0·90)	Stroke (0·99)	CKD (2·20)	Sense (1·03)	LRI (0·83)	Iron (0·91)	Congenital (0·43)
Federated States of Micronesia	IHD (1·54)	Diabetes (2·35)	Stroke (1·38)	LRI (0·73)	Skin (1·41)	CKD (1·91)	Back & neck (0·91)	Self-harm (1·42)	Road injuries (0·49)	COPD (1·26)
Fiji	Diabetes (7·08)	IHD (1·95)	LRI (2·35)	Stroke (1·27)	CKD (3·13)	Asthma (3·05)	Back & neck (0·84)	NN Preterm (1·19)	Congenital (1·04)	Skin (1·40)
Guam	IHD (3·95)	Diabetes (4·34)	Stroke (1·91)	Back & neck (0·94)	Self-harm (1·45)	Lung C (1·54)	Skin (1·38)	Sense (1·27)	LRI (2·13)	CKD (2·92)
Kiribati	Stroke (2·16)	Diabetes (4·10)	IHD (1·46)	LRI (0·68)	NN Preterm (0·53)	TB (2·01)	Violence (2·70)	Asthma (2·61)	NN Enceph (0·74)	Diarrhoea (0·46)

(Figure 7 continues on next page)

would benefit poor people, but also potentially increase overall efficiency of health research.[48] For instance, individuals who have historically underfunded conditions, such as mental health disorders, substance use, and musculoskeletal conditions, would benefit from the greater use of DALYs in decision-making processes.

Global progress has been especially rapid in reducing disease burden due to a number of communicable diseases, including diarrhoeal diseases, lower respiratory infections, tuberculosis, syphilis, typhoid, paratyphoid, and vaccine-preventable infections such as hepatitis B, measles, tetanus, and *Haemophilus influenzae* type b. To

	1	2	3	4	5	6	7	8	9	10
Marshall Islands	Diabetes (3·56)	IHD (1·61)	Stroke (1·46)	CKD (2·85)	LRI (0·78)	Skin (1·39)	Neck & back (0·88)	NN Preterm (0·48)	Iron (1·23)	Road injuries (0·51)
Northern Mariana Islands	Diabetes (4·03)	Neck & back (0·86)	IHD (1·39)	Skin (1·34)	Stroke (1·62)	Depression (0·82)	Road injuries (1·04)	Sense (1·28)	Self-harm (0·64)	Other MSK (1·60)
Papua New Guinea	LRI (1·02)	IHD (1·85)	Stroke (1·71)	COPD (3·50)	Diabetes (3·03)	Asthma (3·13)	Road injuries (0·98)	Diarrhoea (0·43)	Iron (1·06)	NN Preterm (0·38)
Samoa	IHD (0·94)	Diabetes (2·09)	Stroke (0·87)	Skin (1·41)	Neck & back (0·90)	CKD (1·78)	LRI (0·54)	Sense (0·92)	Congenital (0·45)	Iron (0·84)
Solomon Islands	IHD (2·00)	Stroke (1·67)	Diabetes (3·69)	LRI (0·46)	CKD (2·65)	COPD (1·66)	NN Preterm (0·34)	Skin (1·32)	Road injuries (0·65)	Neck & back (0·95)
Tonga	Diabetes (2·23)	IHD (0·90)	Stroke (0·75)	LRI (0·72)	Skin (1·44)	Neck & back (0·92)	NN Preterm (0·53)	Sense (0·83)	COPD (1·03)	Asthma (1·67)
Vanuatu	IHD (1·88)	Stroke (1·81)	Diabetes (2·60)	LRI (0·88)	NN Preterm (0·56)	COPD (1·53)	Skin (1·42)	Road injuries (0·63)	CKD (1·70)	Neck & back (0·91)
North Africa and Middle East	IHD (1·14)	War (796·25)	Congenital (1·18)	NN Preterm (0·78)	Road injuries (0·97)	Neck & back (1·07)	Stroke (0·84)	LRI (0·52)	Diabetes (1·26)	Depression (0·93)
North Africa and Middle East	IHD (1·14)	War (796·25)	Congenital (1·18)	NN Preterm (0·78)	Road injuries (0·97)	Neck & back (1·07)	Stroke (0·84)	LRI (0·52)	Diabetes (1·26)	Depression (0·93)
Afghanistan	War (1033·96)	LRI (0·70)	IHD (4·31)	Congenital (1·56)	Stroke (2·15)	NN Preterm (0·77)	Road injuries (2·38)	Other Unint (9·71)	Diarrhoea (0·24)	Violence (4·00)
Algeria	IHD (0·65)	Diabetes (1·10)	NN Preterm (0·75)	Neck & back (1·04)	Stroke (0·69)	Road injuries (0·69)	Congenital (0·93)	Depression (0·95)	Sense (0·82)	Skin (0·83)
Bahrain	Diabetes (3·31)	Neck & back (0·95)	IHD (0·83)	Depression (1·11)	Skin (1·04)	Road injuries (0·57)	Other MSK (1·92)	Sense (1·02)	Congenital (0·90)	Migraine (1·07)
Egypt	IHD (1·32)	Congenital (1·26)	Stroke (1·04)	LRI (0·77)	Diabetes (1·18)	Neck & back (1·08)	Cirr HepC (7·30)	Iron (1·53)	NN Preterm (0·48)	Sense (0·93)
Iran	IHD (1·24)	Road injuries (1·69)	Neck & back (1·03)	Stroke (0·76)	Diabetes (1·20)	Congenital (1·02)	Depression (1·05)	Sense (0·94)	Other Cardio (3·76)	Drugs (4·09)
Iraq	War (1932·51)	IHD (1·83)	Congenital (1·22)	NN Preterm (0·70)	Diabetes (1·78)	Stroke (1·14)	NN Sepsis (2·44)	Road injuries (0·68)	Neck & back (1·08)	LRI (0·40)
Jordan	Congenital (1·09)	IHD (0·69)	Neck & back (1·00)	Diabetes (1·61)	NN Preterm (0·70)	Road injuries (0·67)	Depression (1·01)	Skin (0·91)	Iron (0·97)	Sense (0·92)
Kuwait	IHD (1·94)	Neck & back (0·88)	Depression (1·18)	Congenital (1·62)	Road injuries (1·32)	Diabetes (2·18)	Migraine (1·06)	Skin (0·88)	Sense (1·09)	Iron (1·18)
Lebanon	IHD (1·01)	War (5581·30)	Diabetes (1·72)	Neck & back (0·83)	Depression (1·02)	Sense (0·90)	Stroke (0·44)	Congenital (1·00)	Skin (0·93)	Iron (1·35)
Libya	War (1966·75)	IHD (0·92)	Neck & back (1·04)	Congenital (1·09)	Road injuries (0·83)	Stroke (0·74)	Diabetes (0·98)	NN Preterm (0·61)	Depression (1·00)	Other Trans (10·71)
Morocco	Diabetes (1·70)	IHD (0·61)	Neck & back (1·14)	NN Preterm (0·57)	Stroke (0·49)	Road injuries (0·62)	Congenital (0·78)	Sense (0·79)	Depression (0·88)	LRI (0·27)
Palestine	IHD (1·31)	NN Preterm (0·69)	Congenital (0·86)	Neck & back (1·06)	Depression (1·29)	Road injuries (0·49)	Stroke (0·70)	LRI (0·26)	Skin (0·81)	CKD (1·22)
Oman	Road injuries (1·60)	Other Cardio (9·17)	Neck & back (0·95)	Diabetes (2·26)	IHD (0·79)	Depression (1·07)	Congenital (0·71)	Sense (1·01)	Migraine (1·10)	Skin (0·86)
Qatar	Road injuries (1·48)	Neck & back (0·94)	Diabetes (2·92)	Depression (1·15)	IHD (0·67)	Migraine (1·12)	Skin (0·94)	Congenital (1·13)	Sense (0·96)	Anxiety (1·05)
Saudi Arabia	Neck & back (0·99)	IHD (0·84)	Road injuries (1·23)	Congenital (1·29)	Depression (1·11)	Skin (0·95)	Migraine (1·27)	Diabetes (1·15)	Sense (1·01)	NN Preterm (1·01)
Sudan	NN Preterm (1·21)	Congenital (1·54)	IHD (1·59)	LRI (0·52)	Road injuries (1·58)	Diarrhoea (0·52)	Stroke (1·05)	Neck & back (1·07)	Iron (0·81)	Diabetes (1·26)
Syria	War (8475·03)	IHD (1·32)	Stroke (0·88)	Neck & back (1·05)	Congenital (0·77)	Depression (0·94)	LRI (0·33)	Sense (0·78)	Road injuries (0·37)	Skin (0·78)
Tunisia	Diabetes (1·32)	Neck & back (1·02)	IHD (0·46)	Stroke (0·59)	Depression (1·00)	Sense (0·82)	Road injuries (0·60)	Congenital (0·83)	NN Preterm (0·60)	Lung C (1·21)
Turkey	Neck & back (1·13)	IHD (0·53)	Diabetes (0·97)	Congenital (0·97)	Sense (0·85)	Stroke (0·40)	Depression (0·92)	NN Preterm (0·82)	Lung C (1·18)	Road injuries (0·51)

(Figure 7 continues on next page)

these successes, the last decade has seen profound declines in the burden from malaria and HIV/AIDS. NCD trends have been much more complicated. For the leading cause of disability, low back and neck pain, a lack of knowledge about risks limits the opportunity for prevention. Occupational ergonomic factors and high body-mass index (BMI) are estimated to be responsible for 30·9% (29·2–32·5) and 5·5% (3·4–7·6) of YLDs due to low back pain, respectively.[49] The highest occupational risk is found in service industries and manual labour, especially agriculture.[50,51] The relatively small proportion of low back pain that is caused by high BMI is amenable to

	1	2	3	4	5	6	7	8	9	10
United Arab Emirates	IHD (2·63)	Road injuries (3·09)	Back & neck (0·99)	Diabetes (3·48)	Stroke (2·11)	Depression (1·18)	Other MSK (1·90)	Migraine (1·14)	Skin (0·93)	Drugs (1·93)
Yemen	War (1090·72)	NN Preterm (1·05)	IHD (2·03)	Congenital (1·34)	Road injuries (1·54)	LRI (0·38)	Stroke (1·16)	Diarrhoea (0·30)	Back & neck (1·11)	Diabetes (1·28)
South Asia	IHD (1·18)	NN Enceph (2·15)	NN Preterm (1·07)	LRI (0·74)	COPD (2·04)	Diarrhoea (1·07)	Stroke (0·82)	TB (1·98)	Iron (1·39)	Back & neck (0·91)
South Asia	IHD (1·18)	NN Enceph (2·15)	NN Preterm (1·07)	LRI (0·74)	COPD (2·04)	Diarrhoea (1·07)	Stroke (0·82)	TB (1·98)	Iron (1·39)	Back & neck (0·91)
Bangladesh	Stroke (1·15)	IHD (0·91)	NN Enceph (1·51)	LRI (0·51)	Back & neck (1·06)	Drowning (2·59)	COPD (1·18)	Other MSK (2·60)	Diabetes (0·99)	Sense (0·95)
Bhutan	NN Preterm (1·24)	IHD (0·74)	NN Enceph (1·88)	Back & neck (1·05)	Iron (1·49)	LRI (0·51)	Diabetes (0·99)	COPD (1·20)	Diarrhoea (0·87)	Sense (0·98)
India	IHD (1·15)	NN Preterm (1·25)	NN Enceph (2·08)	COPD (2·29)	LRI (0·81)	Diarrhoea (1·31)	Stroke (0·78)	TB (2·41)	Iron (1·60)	Back & neck (0·89)
Nepal	Disaster (1942·61)	LRI (0·58)	IHD (0·89)	NN Enceph (1·36)	TB (1·33)	COPD (1·49)	Back & neck (1·13)	Diarrhoea (0·43)	Stroke (0·49)	Road injuries (0·64)
Pakistan	NN Enceph (2·86)	IHD (1·73)	NN Preterm (0·85)	LRI (0·61)	Diarrhoea (0·88)	Stroke (0·86)	Iron (1·02)	TB (1·32)	Diabetes (1·31)	Other Unint (4·33)
Sub-Saharan Africa	HIV (2·70)	Malaria (5·04)	LRI (0·65)	Diarrhoea (0·68)	NN Sepsis (2·39)	NN Enceph (0·83)	NN Preterm (0·48)	Congenital (0·92)	PEM (1·24)	Meningitis (1·10)
Southern sub-Saharan Africa	HIV (14·25)	LRI (1·74)	TB (10·72)	Diarrhoea (3·65)	Diabetes (2·35)	Road injuries (1·42)	Violence (4·87)	IHD (0·75)	Stroke (0·94)	Back & neck (1·03)
Botswana	HIV (14·16)	TB (15·79)	LRI (1·74)	Diabetes (2·21)	IHD (0·92)	Road injuries (1·10)	Diarrhoea (3·93)	Stroke (1·10)	Self-harm (1·95)	Back & neck (0·98)
Lesotho	HIV (19·51)	Diarrhoea (3·49)	LRI (1·86)	TB (10·10)	NN Preterm (1·09)	Road injuries (1·75)	Other NN (5·08)	Violence (4·64)	IHD (1·21)	Stroke (1·34)
Namibia	HIV (8·67)	LRI (1·38)	Diarrhoea (3·47)	TB (8·56)	NN Preterm (0·76)	Road injuries (1·00)	Other NN (3·68)	IHD (0·67)	NN Enceph (1·09)	Diabetes (1·24)
South Africa	HIV (16·28)	Diabetes (2·67)	Violence (7·21)	LRI (2·39)	TB (17·11)	Road injuries (1·70)	IHD (0·76)	Back & neck (1·04)	Stroke (0·92)	Diarrhoea (7·09)
Swaziland	HIV (21·40)	LRI (2·58)	Diarrhoea (6·52)	Road injuries (2·06)	TB (14·05)	Diabetes (2·54)	IHD (1·17)	Stroke (1·42)	Other NN (3·78)	NN Preterm (0·74)
Zimbabwe	HIV (9·51)	Diarrhoea (2·40)	LRI (1·06)	NN Enceph (1·54)	NN Preterm (0·60)	TB (4·29)	NN Sepsis (2·32)	PEM (3·20)	Stroke (0·93)	Road injuries (0·69)
Western sub-Saharan Africa	Malaria (8·72)	Diarrhoea (0·96)	LRI (0·73)	HIV (1·80)	NN Sepsis (3·59)	NN Enceph (0·98)	NN Preterm (0·52)	Meningitis (1·45)	PEM (1·52)	Congenital (0·86)
Benin	Malaria (11·33)	LRI (0·70)	Diarrhoea (0·46)	NN Sepsis (2·64)	NN Preterm (0·53)	NN Enceph (0·78)	Meningitis (1·20)	PEM (1·43)	Congenital (0·80)	Stroke (0·88)
Burkina Faso	Malaria (4·96)	LRI (0·52)	Diarrhoea (0·45)	NN Sepsis (1·77)	Meningitis (1·00)	NN Enceph (0·71)	PEM (0·87)	Congenital (0·88)	NN Preterm (0·36)	TB (0·73)
Cameroon	HIV (3·90)	Malaria (74·07)	LRI (1·17)	Diarrhoea (1·08)	NN Sepsis (4·62)	NN Enceph (0·98)	NN Preterm (0·53)	Congenital (1·04)	Meningitis (1·91)	PEM (2·64)
Cape Verde	Stroke (0·85)	LRI (0·63)	Back & neck (1·01)	IHD (0·48)	HIV (0·53)	Congenital (0·84)	NN Preterm (0·51)	NN Enceph (0·93)	Depression (1·05)	Iron (1·10)
Chad	Diarrhoea (1·22)	LRI (0·95)	Malaria (3·72)	HIV (1·87)	NN Sepsis (2·61)	PEM (1·67)	NN Preterm (0·64)	Meningitis (1·47)	NN Enceph (0·74)	Congenital (0·90)
Côte d'Ivoire	Malaria (32·28)	HIV (2·73)	LRI (0·92)	NN Sepsis (4·37)	Diarrhoea (0·68)	NN Preterm (0·68)	NN Enceph (1·00)	Congenital (0·93)	Stroke (0·96)	Meningitis (1·15)
The Gambia	LRI (0·36)	NN Sepsis (2·23)	Diarrhoea (0·30)	HIV (0·96)	NN Preterm (0·38)	NN Enceph (0·53)	Congenital (0·67)	Meningitis (0·67)	PEM (0·78)	Iron (0·72)
Ghana	Malaria (81·63)	LRI (0·98)	NN Sepsis (5·51)	HIV (1·20)	NN Preterm (0·50)	Stroke (1·03)	NN Enceph (0·84)	Congenital (0·82)	IHD (0·76)	PEM (2·99)
Guinea	Malaria (6·85)	LRI (0·69)	Diarrhoea (0·37)	NN Sepsis (2·22)	NN Preterm (0·62)	NN Enceph (0·85)	HIV (1·09)	Haemog (3·00)	Meningitis (0·96)	PEM (0·88)
Guinea-Bissau	LRI (0·85)	Diarrhoea (0·88)	HIV (2·52)	Malaria (2·60)	Meningitis (1·80)	NN Sepsis (2·87)	NN Preterm (0·71)	PEM (1·74)	STD (3·39)	NN Enceph (0·85)

(Figure 7 continues on next page)

intervention, but the continued escalation of obesity rates indicates that these measures might have little effectiveness. With increasing SDI, the proportion of the workforce in agriculture would be expected to become smaller, which would have some effect on the burden of low back pain. Yet, based on our analyses, nearly 65% of the burden would remain. The management of most low back and neck pain is largely focused on pain relief and prevention of worsening outcomes through physical therapy and exercise; given the very large burden and the associated economic consequences of lost work time, low back and neck pain should be a priority for research to

	1	2	3	4	5	6	7	8	9	10
Liberia	Malaria (2·88)	LRI (0·46)	Diarrhoea (0·43)	HIV (1·23)	NN Sepsis (1·98)	NN Enceph (0·68)	NN Preterm (0·48)	TB (1·07)	Ebola (58898·20)	Meningitis (0·78)
Mali	Malaria (5·95)	Diarrhoea (0·40)	PEM (1·48)	NN Preterm (0·87)	NN Sepsis (2·48)	LRI (0·29)	NN Enceph (0·91)	Meningitis (0·95)	HIV (1·07)	Congenital (0·82)
Mauritania	LRI (0·60)	NN Sepsis (3·54)	Diarrhoea (0·53)	NN Preterm (0·50)	NN Enceph (0·81)	Iron (1·25)	Congenital (0·89)	Back & neck (1·07)	STD (2·22)	Meningitis (0·89)
Niger	Malaria (1·30)	Diarrhoea (0·54)	LRI (0·39)	Meningitis (1·09)	PEM (0·54)	NN Preterm (0·52)	NN Sepsis (1·02)	NN Enceph (0·54)	Congenital (0·60)	TB (0·55)
Nigeria	Malaria (104·66)	Diarrhoea (2·09)	HIV (2·16)	LRI (1·00)	NN Sepsis (5·39)	NN Enceph (1·25)	Haemog (6·32)	NN Preterm (0·48)	Congenital (0·90)	Meningitis (2·19)
São Tomé and Príncipe	LRI (0·67)	NN Sepsis (2·33)	Congenital (0·83)	Stroke (0·97)	Diarrhoea (0·43)	NN Enceph (0·61)	NN Preterm (0·27)	IHD (0·63)	Back & neck (1·04)	CKD (2·03)
Senegal	Diarrhoea (0·52)	LRI (0·42)	NN Sepsis (2·04)	NN Enceph (0·59)	NN Preterm (0·39)	TB (1·21)	Congenital (0·77)	Meningitis (0·95)	Iron (1·04)	Malaria (1·89)
Sierra Leone	Malaria (14·10)	LRI (0·90)	Haemog (7·62)	Diarrhoea (0·61)	Ebola (97400·61)	NN Sepsis (2·97)	NN Enceph (1·00)	NN Preterm (0·66)	Meningitis (1·60)	HIV (1·15)
Togo	Malaria (17·88)	HIV (2·21)	LRI (0·68)	Diarrhoea (0·54)	NN Sepsis (3·19)	NN Enceph (0·88)	NN Preterm (0·55)	Congenital (0·80)	Haemog (3·11)	Stroke (0·83)
Eastern sub-Saharan Africa	HIV (2·56)	LRI (0·58)	Diarrhoea (0·54)	Malaria (2·27)	Congenital (1·03)	NN Enceph (0·71)	NN Preterm (0·42)	NN Sepsis (1·49)	PEM (1·04)	Meningitis (0·90)
Burundi	LRI (0·44)	Diarrhoea (0·43)	Malaria (1·33)	NN Preterm (0·54)	Congenital (1·01)	PEM (0·93)	NN Enceph (0·62)	HIV (0·90)	TB (1·00)	Meningitis (0·64)
Comoros	LRI (0·50)	Diarrhoea (0·43)	Congenital (0·94)	NN Preterm (0·43)	NN Enceph (0·64)	NN Sepsis (1·53)	Iron (0·86)	TB (0·84)	Stroke (0·61)	STD (1·68)
Djibouti	LRI (1·11)	Diarrhoea (1·08)	HIV (1·03)	Congenital (1·26)	Stroke (0·83)	Iron (1·32)	NN Preterm (0·51)	IHD (0·70)	TB (1·54)	PEM (2·98)
Eritrea	Diarrhoea (0·82)	LRI (0·67)	PEM (1·52)	Congenital (0·98)	Iron (1·32)	TB (1·24)	NN Preterm (0·43)	NN Enceph (0·56)	Meningitis (0·91)	Stroke (0·97)
Ethiopia	LRI (0·43)	Diarrhoea (0·36)	TB (1·16)	Congenital (0·97)	NN Enceph (0·69)	HIV (0·83)	NN Preterm (0·36)	NN Sepsis (1·42)	Meningitis (0·76)	STD (1·74)
Kenya	HIV (3·70)	Diarrhoea (1·08)	LRI (0·75)	NN Enceph (0·96)	NN Preterm (0·46)	Congenital (0·86)	Iron (1·30)	Malaria (2·40)	Other NTD (3·37)	Meningitis (1·07)
Madagascar	LRI (0·75)	Diarrhoea (0·78)	NN Preterm (0·52)	PEM (2·24)	Stroke (1·21)	Congenital (0·88)	Iron (1·15)	Malaria (4·00)	NN Sepsis (1·79)	IHD (0·86)
Malawi	HIV (5·07)	Malaria (5·01)	LRI (0·60)	Diarrhoea (0·53)	NN Enceph (0·72)	NN Preterm (0·49)	Congenital (1·00)	PEM (1·09)	Meningitis (0·96)	NN Sepsis (1·32)
Mozambique	HIV (7·73)	Malaria (4·06)	LRI (0·31)	Diarrhoea (0·29)	NN Enceph (0·72)	Congenital (0·98)	NN Sepsis (1·33)	NN Preterm (0·37)	TB (0·92)	Stroke (0·86)
Rwanda	LRI (0·79)	HIV (1·15)	Congenital (1·23)	Diarrhoea (0·42)	NN Preterm (0·50)	NN Enceph (0·75)	PEM (1·65)	NN Sepsis (2·01)	Road injuries (0·98)	Meningitis (1·07)
Somalia	Diarrhoea (0·68)	LRI (0·64)	PEM (0·83)	TB (1·18)	NN Preterm (0·64)	Iron (1·47)	Malaria (0·32)	Congenital (0·81)	Meningitis (0·59)	War (187·71)
South Sudan	Diarrhoea (0·93)	LRI (0·72)	HIV (1·90)	Malaria (2·01)	PEM (1·38)	Meningitis (1·18)	NN Preterm (0·54)	TB (1·10)	Congenital (0·85)	Iron (1·21)
Tanzania	HIV (2·57)	LRI (0·78)	Congenital (1·38)	Malaria (11·61)	Diarrhoea (0·52)	NN Enceph (0·69)	Iron (1·28)	NN Preterm (0·34)	NN Sepsis (2·06)	PEM (1·75)
Uganda	HIV (2·88)	LRI (0·60)	Malaria (9·47)	Diarrhoea (0·50)	NN Enceph (0·87)	Congenital (1·12)	NN Preterm (0·46)	Meningitis (1·45)	NN Sepsis (1·87)	Haemog (3·24)
Zambia	HIV (6·46)	LRI (0·96)	Malaria (39·51)	Diarrhoea (1·19)	Congenital (1·05)	NN Enceph (0·75)	Meningitis (1·93)	NN Preterm (0·33)	NN Sepsis (1·91)	IHD (1·03)
Central sub-Saharan Africa	Malaria (3·30)	LRI (0·55)	Diarrhoea (0·35)	HIV (1·53)	PEM (1·04)	NN Preterm (0·46)	Congenital (0·89)	NN Sepsis (1·62)	NN Enceph (0·64)	Other NTD (3·60)
Angola	LRI (0·95)	Malaria (25·93)	Diarrhoea (0·66)	HIV (1·35)	Congenital (1·09)	NN Sepsis (2·85)	PEM (2·45)	NN Preterm (0·38)	Meningitis (1·62)	Road injuries (1·43)
Central African Republic	Malaria (6·71)	HIV (4·23)	LRI (0·95)	Diarrhoea (0·68)	TB (1·82)	NN Preterm (0·73)	Stroke (1·55)	PEM (1·67)	Road injuries (2·01)	NN Sepsis (2·17)
Congo (Brazzaville)	HIV (3·37)	Malaria (109·15)	LRI (0·97)	Congenital (1·04)	NN Sepsis (3·14)	Stroke (1·20)	Diarrhoea (0·84)	NN Enceph (0·83)	IHD (0·85)	NN Preterm (0·42)
DR Congo	Malaria (2·57)	LRI (0·46)	Diarrhoea (0·28)	HIV (1·28)	PEM (0·86)	Other NTD (3·84)	NN Enceph (0·63)	NN Preterm (0·48)	Congenital (0·81)	NN Sepsis (1·30)
Equatorial Guinea	Malaria (1125·32)	HIV (3·81)	LRI (1·87)	NN Sepsis (6·10)	Congenital (1·39)	NN Preterm (0·73)	Diabetes (1·74)	Road injuries (1·05)	NN Enceph (1·22)	Other NN (2·72)
Gabon	HIV (2·84)	Malaria (968·41)	LRI (1·60)	Congenital (1·23)	NN Sepsis (5·65)	Stroke (1·03)	Diabetes (1·51)	Iron (1·90)	Road injuries (0·93)	IHD (0·61)

0–0·63 | 0·63–0·79 | 0·79–0·90 | 0·90–1·00 | 1·00–1·09 | 1·09–1·24 | 1·24–1·56 | 1·56–2·49 | >2·49

identify more effective preventive and therapy measures.[52] Similarly, despite broad decreases in age-standardised rates of injury burden, the pace of progress for these causes has been comparatively slow and ultimately has led to minimal changes in the proportion of overall burden due to injuries during the past 25 years. Prevention of injuries requires strong public safety policies,[53] but minimising mortality and long-term disability from injuries hinges upon having comprehensive trauma care systems[54,55] that provide timely, evidence-based care,[56–58] including emergency surgical services.[59,60]

In 2015, sense organ disorders were the second-leading cause of YLDs and resulted in more than 68 million DALYs. Reducing DALYs from vision impairment is achievable through vertically integrated programmes, including the delivery of eyeglasses for refractive error, curative surgery for cataracts, and onchocerciasis and trachoma prevention. Given the availability of cost-effective interventions, greater policy attention is needed for vision loss burden. Although interventions for hearing loss are less clear, the use of timely antibiotics for otitis media and meningitis and the provision of hearing aids for conductive hearing loss are likely to reduce its burden.

Reductions in age-standardised DALY rates due to some NCDs such as cardiovascular diseases, most cancers, chronic respiratory diseases, and many digestive diseases—some of which can be attributed to reductions in risk factors such as tobacco and improvements in cause-specific treatment and event survival—mask the effects of population ageing. This means more people had disease burden from these causes and total DALYs have remained largely unchanged (eg, chronic obstructive pulmonary disease) or significantly increased (eg, cardiovascular diseases, cancers, neurological disorders, diabetes, chronic kidney disease, and musculoskeletal disorders such as osteoarthritis and low back and neck pain) over time. As demographic transitions are widely expected to continue, the burden from NCDs is likely to continue expanding. Widespread efforts must continue to enact societal and environmental policies to reduce risk factor exposure, while national and local health systems must adapt to meet the prevention, screening, and treatment needs of their populations. As we now recognise many of the risk factors related to NCDs, low-SDI and middle-SDI countries could adopt policies to circumvent the mistakes made by other countries as they progressed along the SDI spectrum. Mental and substance use disorders are a particularly challenging group of conditions with non-trivial levels of disease burden in all geographies. Some countries provide excellent mental health resources, whereas others, particularly LMICs, do not have screening or treatment programmes. Addressing the growing burden and disparity in mental health disorders will be an especially pressing challenge during the SDG era.

A number of emerging and growing health threats also deserve special attention in policy planning, including infectious diseases such as outbreaks of dengue fever, Ebola virus disease, Zika virus, and pandemic influenza, and antimicrobial-resistant pathogens, which represent acute threats to life and highlight health-system deficiencies where they occur; substance abuse disorders, particularly of opioids and cocaine, in eastern Europe, Australia, and North America; and intentional firearm injuries, especially in Latin America, the USA, and South Africa. In the case of dengue fever and potentially other yet to be identified infectious diseases, urbanisation and global environmental change have contributed to an increased incidence and future climate change scenarios depict a rising trend in the coming years.[61] Other emerging infectious diseases, including Zika and chikungunya viruses, have yet to be comprehensively analysed by the GBD.

A major change in the GBD 2015 assessment has been the closer integration of the assessments of mortality and disease sequelae prevalence in modelling. For cancers, HIV/AIDS, and injuries, previous iterations of the GBD modelled mortality, incidence, and prevalence in a coherent manner. For some other diseases, the modelling of disease prevalence and cause-specific mortality rates largely used different data sources and modelling techniques. Independent estimation of prevalence and mortality led in some cases to patterns across locations of excess mortality rates that were not consistent with expected relationships related to health-system access. For GBD 2015, we built the modelling of cause-specific mortality, excess mortality, incidence, and prevalence into nearly every cause. The effect of this approach has led to increases in the number of DALYs from injuries due to YLDs and changes in prevalence for other conditions, particularly those with minimal data for prevalence or incidence. More attention will be paid in future iterations of the GBD study to identifying unpublished data from cohort studies or linkage studies

***Figure 7*: Leading ten causes of DALYs with the ratio of observed DALYs to DALYs expected on the basis of SDI in 2015, by location**

The ratio of observed DALYs to DALYs expected based on SDI is provided in brackets for each cause and cells are colour coded by ratio ranges (calculated to place a roughly equal number of cells into each bin). Shades of blue represent much lower observed DALYs than expected levels based on SDI, whereas red shows observed DALYs that exceed expected levels. IHD=ischaemic heart disease. Back & neck=low back and neck pain. Diabetes=diabetes mellitus. Stroke=Cerebrovascular disease. Lung C=lung, bronchus, and trachea cancers. Sense=sense organ diseases. Depression=depressive disorders. Alzheimer's=Alzheimer's disease and other dementias. Oth MSK=other musculoskeletal disorders. COPD=chronic obstructive pulmonary disease. NN Preterm=neonatal preterm birth complications. Diarrhoea=diarrhoeal diseases. Skin=skin and subcutaneous diseases. NN Enceph=neonatal encephalopathy due to birth asphyxia and trauma. Drugs=drug use disorders. Congenital=congenital anomalies. Liver C=liver cancer. Stomach C=stomach cancer. CKD=chronic kidney disease. Anxiety=anxiety disorders. Iron=iron-deficiency anaemia. HIV=HIV/AIDS. Colorect C=colon and rectum cancer. LRI=lower respiratory infections. Cirr HepC=cirrhosis due to hepatitis C. CMP=cardiomyopathy and myocarditis. Cirr alc=cirrhosis due to alcohol use. Other Cardio=other cardiovascular and circulatory diseases. Alcohol=alcohol use disorders. Violence=interpersonal violence. HTN HD=hypertensive heart disease. Haemog=haemoglobinopathies and haemolytic anaemias. TB=tuberculosis. Prostate C=prostate cancer. War=collective violence and legal intervention. Other Unint= other unintentional injuries. Oth trans=other transport injuries. Other NN=Other neonatal disorders. NN Sepsis=neonatal sepsis and other neonatal infections. PEM=protein-energy malnutrition. STD=sexually transmitted diseases excluding HIV. Ebola=Ebola virus disease. Other NTD=other neglected tropical diseases. GBD=Global Burden of Disease. SDI=Socio-demographic Index. DALYs=disability-adjusted life-years.

on levels of excess mortality by age and sex, especially in LMICs, to further strengthen modelling efforts.

A major development for the GBD 2015 has been adaptation of the GATHER guidelines endorsed by WHO, the Institute for Health Metrics and Evaluation (IHME), and other organisations.[22,23] GATHER compliance, including the sharing of statistical code for each of the many analytical steps in the GBD, provides a new level of transparency for the overall enterprise. We expect that many researchers will want to investigate, propose improvements, and provide alternative assessments for many components of the GBD. We welcome the debate that will follow on the best way to analyse different components of the GBD. We believe enhanced transparency will lead to healthy debate and exchange and to improved methods, data, and results for many aspects of the GBD. Transparency will not necessarily lead to consensus but it will broaden everyone's understanding of the available evidence on descriptive epidemiology. Adoption by the GBD of the GATHER guidelines will hopefully stimulate other organisations to adopt the guidelines in all aspects of their work as well.

Although the volume of input data to the GBD has continued to increase substantially, major data gaps remain.[12,20,62,63] Geographical and temporal coverage of all-cause and cause-specific mortality datasets are variable, as is the quality of the data contained in such systems. Development of methods to report overall evidence grades for each outcome–location–year combination would be valuable to help to guide strategies for improving data quality and closing data gaps. Investing to develop and improve cause of death and vital registration systems is crucial to improve the quality of insights from the GBD; incorporation of existing data from existing and new collaborators that are not currently in the GBD is another important aspect of this effort. Several countries have experienced significant recent turmoil, especially armed conflict in Syria, Yemen, and other countries in north Africa and the Middle East. Burden from many conditions is believed to have increased during and following those events, but due to disruption of data-collection systems, the full effect of such events has been difficult to quantify. For non-fatal health outcomes, some of the most notable data gaps pertain to aspects of individual diseases and injuries that are not typically included as part of standard epidemiological reports such as distribution of symptoms for those with chronic conditions at various stages of illness, duration of disability following acute events, or long-term disability after major acute injuries. Therefore, our recommendations regarding data gaps pertaining to non-fatal health loss are twofold. First, reports and scientific journals should strive to include reporting on functional health status including severity, distribution, and duration of symptoms with all epidemiological studies. Second, countries should work to centralise and compile existing non-fatal health data and invest to collect population-level epidemiological data on important causes of YLDs.

The iterative and now annual cycle of the GBD revisions provide opportunities to improve the estimation or scope of the GBD. Due to the high interest in Zika virus, we believe that we should try to quantify the burden related to Zika virus disease in the GBD 2016 analysis. Given the focus in the SDGs on various forms of sexual violence, we believe careful investigation of the evidence base for estimation is warranted. As noted in the GBD papers on mortality and non-fatal outcomes,[12,20] there are also a number of opportunities to improve data processing and estimation methods that will be explored for the next cycle of estimation. We also expect to include more subnational analyses, particularly for large countries.

Our analysis has several limitations. First and foremost, the calculation of DALYs and HALE reflects the limitations of all the underlying analyses of the GBD, including all-cause mortality, cause-specific mortality, prevalence, incidence, disability-weight derivation, and simulation of comorbidity. Second, as discussed above, data limitations are apparent in a number of facets of our analysis. Third, inherent to the GBD approach is the effort to quantify specific sequelae of each disease and injury. This means that the full disease burden of certain conditions such as heart failure, anaemia, vision and hearing loss, infertility, epilepsy, and intellectual disability are not as readily apparent in high-level review of the GBD results. However, the YLDs for these impairments are reported elsewhere.[20] Fourth, our analysis of the relationship between SDI, DALYs, and HALE reflects the average historical relationship between SDI and each measure, so despite often strong correlation with SDI it cannot be interpreted as being causal in nature. In some cases, association of SDI with health indicators could be considered a confounder when the same elements (education, income, and fertility) are used to develop both the index and as a covariate in cause-specific models. SDI utility might be improved in the future through consideration of additional societal elements such as inequality in each component. Other measures that capture the status of women in society, such as the female labour-force participation, could be considered in future revisions. Fifth, we have assumed independence of uncertainty between YLLs and YLDs as well as between YLDs and life expectancy. Empirical evidence to guide alternative assumptions, however, is currently very limited. Sixth, recent events in Syria and Libya and the resulting mass migration have led to considerable health loss, including drownings of many migrants. New migrants have different health problems than the populations of the countries to which they have moved. Both the drownings and the change in health status in countries receiving migrants are not adequately captured in this assessment due to the time-lags in data collection and data capture intrinsic in all health data systems. Seventh, estimates of expected burden from SDI alone are based on the average levels of burden at each level of SDI. For endemic diseases, comparisons of observed rates to expected rates will lead to high observed over expected ratios in endemic countries

and low ratios in non-endemic countries. Interpretation of the ratios for conditions that are endemic in only some countries needs to take this into account.

WHO has estimated DALYs by cause for the single years of 2000 and 2012.[13,17] They used published GBD 2010 results used to generate WHO 2012 DALYs for 132 causes with some modifications. First, WHO life tables were used instead of GBD life tables.[14] WHO life tables are different from the UN Population Division life tables and use a set of methods developed by Murray and colleagues in the late 1990s;[11,64] this approach does not benefit from the many improvements in data processing and estimation methods that have emerged in the last 15 years.[12,65,66] Second, WHO altered the empirical disability weights, which were derived from an international sample of more than 60 000 respondents from the GBD analysis[26] for 32 outcomes using the opinions of 45 respondents.[13,67] Third, WHO calculated YLLs after changing from the GBD 2010 normative standard life expectancy of 86·0 years to 91·9 years.[68] Fourth, rather than using GBD results, WHO elected to use alternative estimates for 12 causes of death, including tuberculosis, HIV/AIDS and other sexually transmitted infections, malaria, whooping cough, measles, schistosomiasis, maternal disorders, cancers, alcohol and drug use disorders, epilepsy, conflict and natural disasters, and road traffic accidents.[13] Finally, WHO substituted prevalence estimates produced internally for vision loss, hearing loss, intellectual disability, infertility, anaemia, back pain, alcohol use disorders, headache, and skin diseases. The final hybrid estimates of DALYs do not provide uncertainty measures and have not been peer-reviewed.

WHO has also produced HALE estimates for three time periods, 2000, 2012, and 2015, using GBD 2010 results as described above for 2000 and 2012, and GBD 2013 results for 2015, also without uncertainty measures.[14] Differences between their estimates and those for HALE from GBD 2015 reflect changes in age-specific YLDs per capita from GBD 2013 to GBD 2015 and differences in WHO life expectancy (appendix p 85). The EC and the OECD also report healthy life expectancy estimates based on self-reported health status from 2004 through 2014, but without specific consideration of prevalence or incidence of disease.[52,53] Comparison of 2014 estimates from the EC and GBD mostly show lower estimates from EC (appendix pp 86–87). EC estimates also report much wider ranges in HALE across countries in Europe than those estimated through GBD. Further, in a number of countries, EC estimates point to lower HALE among women than for men. These differences, both in terms of absolute estimates and those by sex, are probably due to the inclusion of non-health factors in self-reported assessments of disability.

In conclusion, HALE has increased steadily throughout the world over the MDG era, with a concomitant decrease in age-standardised DALY rates from most conditions. Declines occurred in overall health loss due to many communicable, maternal, neonatal, and nutritional diseases. Much of the evolution of health is consistent with the expected changes in disease burden with development that have been quantified in this study. Substantial variation in burden compared with levels expected on the basis of SDI suggests wide heterogeneity in the ability of governments and health systems to adequately meet the health needs of their populations. Progress in reducing these gaps will be crucial to achieving the ambitious SDG agenda. Demographic changes leading to increased population size and older average age have offset otherwise important gains in age-specific DALY rates leading to rising burden on health systems for many ailments of ageing. Emerging health threats and causes with lagging progress should be viewed as essential foci for investment in health infrastructure and health data systems to improve the global community's insights into the aggregate quality of care and the overall health of populations.

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CJLM, NK, and NF prepared the first draft. CJLM and ADL conceived of the study and provided overall guidance. All other authors provided data, developed models, reviewed results, initiated modelling infrastructure, and/or reviewed and contributed to the report.

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